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ABSTRACT

The College of the Atlantic (COA) developed a broad-based, interdisciplinary curriculum in ecological policy and community planning and decision-making that incorporates two primary computer-based tools: ARC/INFO Geographic Information System (GIS) and STELLA, a systems-dynamics modeling tool. Students learn how to use and apply these tools through a combination of classroom workshops and experience in real-world settings. Community decision-makers from organizations and towns surrounding the college play an active role in curriculum development and teaching, and students and faculty work side-by-side with these professionals on particular projects. A permanent director was hired for the GIS lab, and the college established a dedicated facility, the Center for Applied Human Ecology (CAHE), which serves as resource center for both the college and the community to conduct research workshops and joint planning projects. Other outcomes of the project include: an institution-wide commitment to the application of computers, from systems dynamics modeling to on-line services via the Internet; the addition of two new faculty members; and a rapidly growing interest in COA's approaches to planning from a variety of international directions, with resulting opportunities to build international partnerships with other institutions facing similar problems in Latin America, the Caribbean, and Asia. News articles on the project are appended. (SWC)

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ED 416 820

COVER SHEET

Computer-Assisted Community Planning and Decision Making

College of the Atlantic
Center for Applied Human Ecology
105 Eden Street
Bar Harbor, Maine 04609

Grant Number: P116B10302-93

Project Dates:

Starting Date: October 1, 1991
Ending Date: December 31, 1994
Number of Months: 36 (plus 90 day extension)

Project Directors:

John G.T. Anderson, Ph.D.
Richard J. Borden, Ph.D.
College of the Atlantic
105 Eden Street
Bar Harbor, Maine 04609
Telephone: 207-288-5015

FIPSE Program Officer(s): Jay Donohue

Grant Award:	Year 1	$57,847
	Year 2	$55,144
	Year 3	$32,500
	Total	$145,491 All totals reflect yearly adjustments.

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SUMMARIES

1. Short Abstract

College of the Atlantic has developed a curriculum in ecological planning and decision making incorporating two primary computer-based tools ARC/INFO and STELLA. Students learn the workings and application of these tools through a combination of classroom workshops and experience in real-world settings. Community decision makers from organizations and towns surrounding the college play an active role in curriculum development and teaching, and students and faculty work side by side with these professionals on particular projects.

John G. T. Anderson and Richard J. Borden

College of the Atlantic, Bar Harbor, Maine 04609

Project Title: Computer-Assisted Community Planning and Decision Making

2. EXECUTIVE SUMMARY

Computer-Assisted Community Planning and Decision Making

College of the Atlantic
105 Eden Street
Bar Harbor, Maine 04609
(207) 288- 5015
Project Directors:
Dr. John G. T. Anderson, Professor of Ecology and Human Ecology
Dr. Richard J. Borden, Academic Dean

College of the Atlantic is engaged in the development of an integrated program in ecological planning and decision making involving a significant degree of hands-on work involving individuals and groups beyond the traditional college community. A major focus of this program is the application of tools developed in classroom settings to particular problems faced by citizens in late 20th century rural and urban environments.

Prior to the beginning of the FIPSE process the college had already begun to develop a network of community contacts involving a working relationship with the four towns and national park with which the college shares Mount Desert Island. While these contacts set the stage for a much greater degree of co-penetration of the college and the community into the

educational setting, there was still no unifying theme or force that provided a clear path that students could follow in their education.

The FIPSE grant provided the college with funds to initiate a relationship with The M.I.T. Laboratory for Computer Assisted Negotiation in selecting software tools that could be applied to regional projects in coastal Maine. The purpose of this relationship was two-fold: first to test the applicability of particular software tools to given projects, and second to provide a catalyst around which a group of faculty could form a discrete curriculum of studies.

The software selected for the program consisted of the ARC/INFO Geographic Information System (GIS) and STELLA, a systems-dynamics modelling tool. The college already had some experience in the use of ARC/INFO, but STELLA was entirely unknown to us. Students and faculty from M.I.T. provided valuable advice on programming, applications, and relevant mind-sets needed to utilize a "systems approach" to problem-solving.

Once a number of faculty and staff had received initial training in software applications, we moved into the community, soliciting project proposals from town decision-makers and officials. Regular meetings were held between students, faculty, and community members, with all persons involved working together on joint problem solving. This approach has allowed students access to the actual mechanics of governance, and created a "living laboratory" environment in our relations with town government. In addition, town planners, select-people, and National Park Service officials were brought in on a regular basis, either as guest-lecturers or as co-teachers of established courses.

Simultaneous to the development of particular projects, a group of faculty began meeting as a "Center for Applied Human Ecology". This group served both as a forum for reviewing projects conducted under the FIPSE grant and also as the focal unit for curriculum development. After extensive discussions with other faculty, regular meetings with students and alumnae, and review of the program of studies taken by alumnus who had gone on to do work in planning and/or decision-making, the group arrived at a formal curriculum that enhances and formalizes planning and decision making component of the College's general academic program, while maintaining a clear extension of the College's overall mission of Human Ecology education.

Acceptance of GIS as a tool by faculty, students, and the community was fairly rapid, especially once the College's Graphics Lab was re-organized and structured under a permanent full-time director. Widespread use of STELLA has taken somewhat longer than expected, in part because of the lack of clear community needs for products of the system. Incorporation of STELLA modelling in several existing classes, as well as the development of specific classes addressing systems dynamics in a variety of settings seems likely to lower the threshold for this

program to achieve its true usefulness.

Perhaps the most successful outcome of the FIPSE process has been the coalescing of a distinct group of faculty interested in environmental planning within the overall college. A number of new courses have been generated as a result of newly perceived needs, and we have found numerous advantages in the team-work approach that the project emphasized. Ideas generated in FIPSE discussions have had a profound affect on a number and definition of subsequent hirings, and we look forward to seeing the results in the form of the first "generation" of students trained within the curricular framework that we have developed.

The general consensus of participants in the project is that with appropriate background, computer tools can play an important part in both an academic curriculum and real-world problem solving. The mixture of classroom training and hands on exposure to forms of governance is invaluable, especially as it serves to highlight both the strengths and the weaknesses of a particular approach to a given problem.

An important secondary gain from this project has been a clarification of the College's goals and programs for international and sustainable development studies. These ideas have found substantial additional support, academically and financially, and represent a major new direction for the institution since the commencement of this project.

A. PROJECT OVERVIEW

This project was an outgrowth of a network of on-going relationships between College of the Atlantic and its surrounding communities. Ever since the college opened in 1972, there has been a conscious effort to try to incorporate aspects of our immediate surroundings in the academic program. This has produced many different initiatives which include projects in science, teacher education, architectural design, and public policy.

A focal element in these initiatives has been the idea of providing students with direct hands-on experience in real-world settings. The intent has been from the first to encourage a high degree of integration between coursework and actual practice, in which students would be working side by side with active professionals in addressing practical problems. In this we have attempted to blur the traditional separation between "academic" and "non-academic" portions of a student's learning experience, and in so doing, better prepare them for the world following graduation.

A significant advantage in this approach has been a network of cooperative agreements between the College, Acadia National Park, and the four towns on Mount Desert Island, where the college is located. Professionals and decision-makers from the region have appeared as guest lecturers, student project sponsors, and in some cases have taught or co-taught entire courses. In turn, faculty and students have served as consultants and collaborators on town and park-related projects.

In the mid 1980's, the college received funds to purchase a single geographical information systems (GIS) work station and plotter. As students learned the basics of digital mapping they began to look for opportunities to apply their skills to real-life projects. At the same time the neighboring towns were faced with a state mandate to develop comprehensive land use plans and an ever-present necessity of updating zoning and tax maps. In addition, the National Park Service (NPS) was anxious to develop its own access to GIS capabilities, and was also interested in collaboration with the communities adjacent to the park on a variety of zoning and land-use issues.

Initial cooperative agreements between the college, the towns, and the NPS permitted the development of basic data layers incorporating road networks, topography, hydrology, etc. Once these data were in place, there was general agreement that the GIS methodology was also a very efficient and flexible way to examine the long term consequences of different planning assumptions. For example, when local officials were shown a "build out" scenario based on a two acre subdivision rule they were immediately shocked into reexamining their fundamental approach to land use planning.

Although our approach appeared highly promising, growth was uneven in a variety of areas, and we recognized the need for both reorganization and a specific focus on the academic program. Both student and community demand for GIS services exceeded the time available to existing faculty, and the development of new technologies, while promising in and of themselves, involved a further drain of available resources. It was under these circumstances that we applied to the FIPSE program for funding.

During the three years of FIPSE support, the college has developed a broad-based interdisciplinary program in ecological policy and community planning. There has been a substantial improvement in the scope and quality of work in COA's GIS lab including hiring of a permanent director. The college has also established a dedicated facility, the Center for Applied Human Ecology (CAHE), which serves as a resource center for both the college and the community to conduct research workshops and joint planning projects.

Other important features that have come out of planning initiated and implemented through the FIPSE project include: (1) an institution-wide commitment to the application of computers in a variety of areas --- from systems dynamics modeling to on-line services via the Internet (2) the addition of two new faculty members in the areas of environmental economics and political economics to support a multidisciplinary program in sustainable economic development; and (3) a rapidly growing interest in COA's approaches to planning from a variety of international directions. It is this last dimension that has been especially gratifying. Our original aim was primarily to develop capabilities to work collaboratively on regional issues of the Maine coast. However, because of the professional networks of the project team members, the model we developed has captured the attention of colleagues elsewhere. This has given us special opportunities to build international partnerships with other institutions facing similar problems in Latin America, the Caribbean and in Asia.

B. PURPOSE

Community leaders and citizens in the late 20th century are faced with the demands of rapid decision making on increasingly complex and far-reaching development issues. Decisions that might once have had strictly local consequences now reach across town borders and impact people who have had no say in the decisions that affect them.

We believe that educators have a primary responsibility in the democratic process. However, a disadvantage of traditional forms of education dealing with the democratic process and decision making has been the separation of the academic and practical components. At the same time,

we find ourselves on the threshold of new technologies for assembling and communicating vital information for planning and decision-making purposes.

Academics all too often distance themselves from the practical implication of their work. Even when teachers are actively involved with "real-world" projects there may be a strong pedagogical incentive to keep the details of on-going work separate from the classroom setting. Planning and decision-making is often confusing and at some levels arbitrary, and it may be easier to teach idealized case-studies rather than acknowledging the less straight-forward nature of reality.

The objective of this project was to develop at College of the Atlantic an expanded student-centered curriculum in planning and decision making, based on hands-on experience with real world situations and incorporating state-of-the-art software tools. Our initial proposal to the Fund for the Improvement of Post-secondary Education (FIPSE) was to provide support to develop computer assisted community planning and decision making on Mount Desert Island, and to use this practical opportunity as the center piece for an innovative interdisciplinary educational program.

At the heart of the program was refinement of existing cooperative arrangements with the communities immediately adjacent to the college, and extension of collaborative opportunities to other geographic areas, including possible international components. We also wished to expand beyond our GIS-centered approach to computer-assisted planning by developing links with the Massachusetts Institute of Technology, and evaluating software in use at that institution in our own program.

Over the course of the grant period, we have achieved the broad intentions of the project, although there have been some modifications in timing and details. As we noted in our Year 1 and Year 2 progress reports, we experienced some difficulty initially in filling the position of director of the computer lab. The person who was finally hired is very well trained in geographical information systems, and we have since made unanticipated progress in the expansion of these tools in several new areas. The reliance on a temporary part-time personnel to establish our systems dynamics modeling component also produced irregular progress and delayed early developments in these areas. However, the recent appointment of a full time mathematician who has gone through STELLA training now promises to bring these objectives back in line.

The administrative pitfalls of the project seem to be related to it's broad mandate. The academic calendar does not always fit the actualities of local events, and the coming and going of students through graduation and/or term breaks can leave some projects unattended or

incomplete. Similar difficulties also arose when even moderate-sized groups of faculty, students, and townspeople --- each operating on their own schedules --- tried to find workable meeting times. Added to this is the loss of critical participation as key faculty members rotate through their sabbatical schedules. Taken together, these problems have not degraded the quality of the overall program, but they have slowed it down and made us emphasize certain aspects more than others. For the most part, local professionals have been very understanding of these limitations. In conclusion, the best way to have avoided these obstacles might have been through less ambitious expectations about specific timing. Aside from these variations in sequencing, the overall project has been a substantial success for the college.

C. BACKGROUND AND ORIGINS

College of the Atlantic was founded in 1969 as a private liberal arts college with an educational mission focused on social and environmental problem-solving. Organized around a non-departmentalized interdisciplinary faculty, the college offers a single baccalaureate degree, the Bachelor or Arts in Human Ecology, and a Master's of Philosophy in Human Ecology. While the term "human ecology" has been a source of on-going discussion and refinement over the years, it is generally understood as the study of the complex relationships between humans and their natural, social and technological environments. As a unifying perspective for combining the ecological sciences and human studies, it has given students a practical framework for individualized and problem-centered liberal studies. COA students have made use of their interdisciplinary studies in many ways --- from entry level positions in environmental, business and community service careers, to preparation for a wide variety of advanced studies.

A fundamental goal of the college since it's founding has been the development of highly educated and motivated citizens, capable of affecting change at local, regional, national, and international levels. From the outset, an important component of the college's philosophy has been the idea of self governance. Students serve as voting members of all administrative committees, and policy decisions are brought to an all college meeting -- modeled on the New England town meeting -- for debate and discussion. Students are thus made aware from their first days at the college of the importance of participation and of the need for collaborative rather than adversarial approaches in settling issues. In addition, courses are deliberately designed to relate wherever possible to current issues in all fields, in order to reduce the separation of "academic" issues from the landscape of the "real world".

The college is located on Mount Desert Island, an 80,000 acre island in eastern Maine that is connected to the mainland by a two-lane causeway. Approximately 45% of the island is taken up by Acadia National Park, the smallest and second most visited park under the jurisdiction of the National Park Service. The remainder of the island is governed by four separate towns,

each of which has its own particular agendas and attitudes towards collaborative planning. The local economy is highly seasonal, with over 2 million visitors to the island in the summer and virtually none in the winter. This skew in visitation places a severe load on community services, which must provide for the summer surge out of a tax base consisting of only a few thousand property owners.

Prior to the beginning of the FIPSE program the college had served as "honest broker" in a number of intra and inter-town and town/park projects, but these had occurred on a somewhat ad hoc basis, and were not necessarily tied into the college curriculum. Concern about increased development for the highly seasonal tourist trade on the one hand, and loss of a taxable land-base to the National Park, on the other, had resulted in widespread concerns.

The primary academic purpose of the FIPSE project was the development of a focused program in Community Planning and Decision Making. At the core of this new program, a sequence of courses dealing with ecology, decision making, government, and applied technologies was proposed. Some of the courses were already in place, but they lacked the thematic integrity to provide a coordinated curriculum of study.

The college was also developing a computer graphics lab containing an ARC/INFO Geographical Information System (GIS) and ERDAS image analysis software. The lab was staffed by one part-time administrator and a rotating group of two to four students. Courses in GIS had traditionally been taught as an over-load by a faculty member in Zoology. At the beginning of the project the software and hardware in the lab were used by a limited number of faculty and students, and we clearly lacked sufficient personnel to take full advantage of the facility. Through the use the FIPSE support, we proposed to both broaden the use of computers within the college and to conduct an active outreach into the community to provide a more interactive service.

The project consisted of a three-pronged effort. First, we wanted to develop a firmly grounded interdisciplinary program in Community Planning and Decision-making. Second, we needed to enhance and professionalize our computer capabilities in computer-assisted planning. And third, we wanted to expand and enrich the two-way flow between the college and surrounding communities and to experiment with a range of collaborative methodologies. Overall, the project required strengthening in each of these components and at the same time an integration of them.

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D. PROJECT DESCRIPTION

1. Curriculum Development

The project's goal to develop a more formalized curriculum in Community Planning and Decision-making under the rubric of Human Ecology represented a significant philosophical shift --- from the College's traditional almost fully-open attitude towards degree requirements --- to a more structured program. Given our commitment to a student-centered approach to education we were determined to maintain a high degree of flexibility in course planning while at the same time ensuring a maximal level of core knowledge.

Our hope is that a student taking this curriculum will develop a solid background in science, law, design/aesthetics, political science, and economics. In addition, they will be able to express themselves in speech and writing. Such graduates will be ready to work in a non-profit organization or go to an applied graduate program such as the Yale School of Forestry.

Classes have been divided into three basic groups: foundational material essential to all students interested in applying Human Ecology regardless of their eventual focus, intermediate courses that advanced seminars and practica that allow the students to sharpen particular skills and to apply the "toolbox of ideas" that the earlier courses have given them.

A general outline of the program that has developed is as follows:

Ecological Planning & Policy Program
Recommended Course Sequence

I. Foundations: foundational material essential to all students interested in applying Human Ecology regardless of their eventual focus

Human Ecology Core Course
Writing Seminar I and II or demonstrated competency in college level writing
Statistics
Biology I & II
Chemistry I
Ecology or Ecology: Natural History or Marine Biology
Foundations: Intro. to Visual and Environmental Studies
Two-Dimensional Design
Intro. to the Legal Process or Philosophy of the Constitution
Intro. to Economics

II. Intermediate: courses that begin to direct students towards particular areas of interest

History of American Reform Movements or Environmental History or Roots of the Modern World
Presentation Skills or Technical Writing
Community Planning and Decision Making or Political Theory and Ecology or Resource Economics
An upper level science course e.g. Animal Behavior or Plant Systematic or Plant Taxonomy or Evolution or Morphology and Diversity of Plants or Woody Plants or Fisheries Biology or Ornithology or Herpetology or Mammalogy or Bio-organic Chemistry or Water Quality on Long Pond
Architecture or Landscape Architecture
GIS or Environmental Journalism
Environmental Psychology or Personality and Social Development
Land Use Planning Studio or Environmental Law and Policy
Historical Geography or Cultural Ecology of the Maine Wood Products Industry or Cultural Ecology of the Maine Fishing Industry

III. Advanced: seminars and practica that allow the students to sharpen particular skills and to apply the "toolbox of ideas" that the earlier courses have given them

Legal Aspects of Land Use or Advanced Land-use Seminar
Whitewater/ White Paper or Use and Abuse of Public Lands or International Environmental Law or Wildlife Law Seminar
Conservation of Endangered Species
Advanced Political Economy or Community Economic Development
Ecological and Economic Systems and Carrying Capacity
GIS II or Systems Dynamic Modelling with STELLA

Students will complete their program with a series of electives dealing with particular areas of interest. They also will complete a required internship with an organization or government agency working in planning and decision-making, and a Senior Project that demonstrates the students mastery of the skills gained over the course of their undergraduate program and integrates their overall knowledge-base with the concept of Human Ecology.

A more complete description of the rationale and goals for these courses, as well as details of course descriptions, course sequencing, and team-teaching arrangements have been incorporated into the two previous annual reports. Like all COA degree plans, many of the decisions about direction and emphasis are worked out in on-going student advising team meetings.

Initial models of the curriculum essentially used the metaphor of a tree --- a thick central "trunk" of courses with a network of "branches" consisting of electives or alternatives that met individual needs. It became clear over the span of the FIPSE process that this model was too constricting and failed to give students enough depth once they had decided on a particular direction. By the conclusion of the project we found ourselves more comfortable with the idea of the curriculum as a perennial shrub: a solid root-stock of core courses containing basic information, and then a number of independent "shoots" or "runners" that students could follow to greater specialization in one aspect of planning and decision-making. The Senior Project under this metaphor becomes the "flower" at the end of the shoot.

2. Computer Tools

The second major goal was to develop a set of powerful computer tools for participatory planning. Work with faculty and students at M.I.T. during the course of the grant made it clear that it would be best to focus our efforts on a limited number of computer software tools. The learning curve implied by many of the available systems and the highly specialized nature of particular packages rendered them unsuitable for our course structure.

After detailed discussions we agreed to focus on two central systems to be thoroughly expanded within the College's interdisciplinary program: ESRI's ARC/INFO Geographic Information System (GIS) which we already had in place, and STELLA, a systems-dynamics modeling tool. ARC/INFO required only a greater degree of organization and coordination to be incorporated more fully into the program. Provision of a dedicated lab director led to both standardized data development --- ensuring increased confidence in the system and greater use by the community, and also enhanced curricula offerings in the form of formal classes and independent studies, tutorials, and project sponsorship. The expansion of the director's role also freed other faculty to develop additional courses and to work in a variety of teams with the director.

A. Geographical Information Systems

Prior to the FIPSE project, the GIS lab was a student-centered facility with one course per year taught by Professor Anderson, supporting a variety of student and faculty research projects. The main problems were a lack of year-round lab management, no permanent full-time interface between the lab and towns and organizations with whom the college was working, and no long-term resources for continued training of students.

In January, 1992 a half-time lab director was appointed to address these issues. Additional equipment was acquired through a Title III grant to increase the number of PC work stations to six. Lab equipment has been continually upgraded to maintain a high technological standard.

All lab PCs are now 486 systems, and are networked to the Sun work-station and to the College's computer network. Additional grant money has been received to allow upgrade of the lab's pen plotter to a high resolution ink-jet plotter, and to add four UNIX work-stations. In 1993 the college added GPS capability to the lab with acquisition of a Trimble GPS base station and mobile recording unit.

An introductory course was taught in the 1992-93 academic year, and two courses (an Introductory and an Applications course) have been taught in subsequent years. Several students pursued independent studies to gain the equivalent training and experience, others have conducted senior projects and we have already had one graduate student complete his M. Phil, degree in the lab.

A team of trained students worked on a variety of projects during the academic year, and as employees during the summer, enabling the GIS lab to provide an increased level of services and consulting to area towns and agencies.

In January, 1994 the GIS lab director's position was upgraded to full time and we were able to hire a recent graduate of the University of Pennsylvania Graduate Program in Landscape Architecture and Regional Planning, trained under the direction of Ian McHarg. Through this appointment we have been able to increase the number of courses taught in the lab and the range and quality of student, faculty and community projects.

The lab has developed a highly detailed model of Mt. Desert Island which is an exceptionally valuable resource for education, technical training, decision making and community service. This data model is the most diverse GIS developed for any region thus far in Maine and includes information on Bedrock Geology, Surficial Geology, Hydrology, Topography, Vegetation, Land Use, Tax Parcels, Structures, Utilities, Zoning, National Wetlands Inventory, Acadia National Park Boundaries, Roads, Carriage Roads and Trails, Conservation Easements, Digital Terrain Model, FEMA Flood Zones, Satellite imagery, Watershed Boundaries.

The GIS Lab was awarded a private foundation grant in December, 1994 which will enable us to replace our older pen plotter with a color ink-jet plotter. This will modernize our graphic output capabilities and enable us to provide towns with more detailed, readable, high quality maps. This grant has also provided for four UNIX workstation terminals to upgrade several PC seats to the UNIX environment. This will provide access to much greater computing power, sophisticated GIS software, graphic development and productivity. Additional capabilities include viewshed and watershed modeling and work with satellite and other types of imagery.

The GIS Lab is connected to the rest of the campus via a campus wide computer network which provides E-mail and other services. This has connected the GIS Lab and Graphic Design Studio, which are adjacent to each other, electronically, creating a network of SUN UNIX, Apple and DOS PC based computers.

GIS in the Academic Curriculum

In our initial grant proposal we suggested the development of in-house interfaces for the GIS using ESRI's Simple Macro Language (SML) as a scripting process. Although we did generate a number of SML macro scripts that greatly enhanced data development tasks, it soon became clear that the pace of technology was outstripping us. ESRI developed ArcView 1 providing a major step forward in user accessibility for GIS data, and we were able to take advantage of this program to move the GIS into a broader community without relying on campus-based programming.

The release of ArcView2 further enhanced this process by allowing greater functionality and flexibility in both data presentation and analysis. As a result GIS can be used more easily and more often in course work, and is much more readily available to the general public with only a short period of familiarization. The director of the lab has embarked on a series of training sessions in ArcView2 for faculty and community planners with very encouraging results. More training is being planned for the future.

Primary areas of focus remain on landuse planning and sustainable development, conservation biology and marine mammal and seabird research. These particular areas are expanding the scope of factors considered in the GIS. Students continue to be the key to our GIS program, often serving as innovators or facilitators to new ideas and people. The most successful and beneficial class projects to date have been those where students have worked on projects addressing real issues on the island.

B. System Modeling

At the beginning of the project, the college established a cooperative arrangement with the Massachusetts Institute of Technology (MIT) Project on Modeling for Negotiation Management. The purpose of this arrangement was to foster direct interaction between students and faculty at College of the Atlantic, MIT and local citizens and officials who agreed to participate. We were able to successfully apply a Systems Dynamics software to a number of local issues and to incorporate the software into the college's curriculum.

Implementation of STELLA was somewhat more problematical than GIS, given that nobody on campus was familiar with the program at the start of the grant. FIPSE-sponsored training sessions allowed faculty and staff members to develop a degree of expertise in both the program itself and underlying concepts in systems dynamics. Rather than simply focusing on one or two "techniques" courses, we have endeavored to incorporate use of STELLA into an array of more general classwork, ranging from ecology and planning to mathematics. Students are thus exposed to the "systems approach" from a number of perspectives.

As with other areas of the curriculum we focused on practical application of techniques to real-world problems. For example, an extremely controversial issue of sewer user fees in the Town of Mount Desert became the major focus of one of our joint efforts. Michael Toole, a Ph.D candidate from MIT, along with COA faculty and students, worked with citizens representing dynamically opposed views to create mutually acceptable models of alternative fee structures for the town sewer. Through these models we were able to predict the implications of various methods of shifting the burden of sewer system costs from property tax base to user fees. While the models themselves were sufficiently complex to make their actual construction daunting for citizens, they were able to agree upon each of the various components and methodologies. However, a sudden shift of elected officials on the town's Board of Selectmen resulted in the tabling of this issue for the foreseeable future.

Another MIT graduate student Greg Howland, taught a course in System Dynamics at COA where students applied STELLA to a range of diverse issues. Several of these projects were quite successful and elicited substantial interest from the Town of Bar Harbor and Acadia National Park. One was a study of potential effects on the harbor of the dramatically increasing cruise ship use. The town has been considering dredging a channel to allow docking of cruise ships at the town pier. How this will impact the local fishermen and recreational boaters is not clear and the model revealed some surprising possibilities. The town is interested in pursuing this model further before any decisions are made on the dredging. Another student constructed a model which attempted to predict and analyze the various tax implications of conservation easements. The Park Service is interested in further development of this model and feels it could help them in numerous situations throughout the park system.

Several COA faculty members and students were trained by High Performance Systems in Cambridge to use the systems dynamics modeling software and it has been incorporated into a variety of ongoing courses. Dr. Anderson used the software in his Ecology class to demonstrate a systems approach to ecosystems and to illustrate some of the inherent weaknesses in this philosophic model. Dr. Donald Cass, a chemistry professor, is using STELLA to model water quality and hydrology on a major lake which is a water supply for one town but is substantially

surrounded by another town and the national park. A new faculty member, Dr. Martha Dickinson, a mathematician and physicist, now offers a full course in systems dynamics using the STELLA software. Her students are applying the software to a diverse range of projects. These include populations studies, predator-prey models, the depletion of the cod fisheries off the coast of Maine, the effects of drought resistance to the biodiversity of plants within a region, the effect of fertilizer on the symbiotic relationship between potatoes and fungus, modeling of air pollution in the park, and the spread of the AIDS epidemic.

As we continue to work with the towns in development of their comprehensive plans, other complex issues are sure to arise which lend themselves to these STELLA modeling techniques determine the potential outcome of interdependent systems. More students are being instructed in the use of the software and will hopefully be able to bring that knowledge to bear on the problems we address in our Advanced Land Use Planning classes.

3. Center for Applied Human Ecology: College - Community Relations

Early in the FIPSE process we identified a group of existing faculty that would be interested in the outcome of a coordinated effort to incorporate planning and decision making into the curriculum. After negotiations with the college administration we secured a dedicated space that could be used for meetings and would house a set of archives relating to college/community projects. We hired part-time secretarial help that allowed us to assemble both a computerized database of existing publications on planning and decision making, and a resource library of the most relevant documents and publications.

The Center for Applied Human Ecology rapidly became a key element in the development of further college/community relations. Regular meetings were held between faculty and students interested in the overall project theme, and between college and townspeople interested in particular projects. Examples of some of these projects have been included in our previous annual reports.

At the conclusion of the grant it became apparent that the Center had created a very real sub-discipline within the College's overall commitment to Human Ecology, and faculty and students agreed that it should become a permanent element of the college environment. Meetings alternate between business sessions dealing with the specifics of on-going work, and more abstract or theoretical discussions of books, articles, or particular news items.

E. EVALUATION/PROJECT RESULTS

The intended audience for the project was quite diverse, ranging from students and faculty at the college to a wide array of community members. Each group had particular background strengths and weaknesses that affected the overall outcome. One significant conclusion that can be drawn from our experience is that computer-based learning tools are an effective way of drawing individuals from a multitude of backgrounds into the process. Graphical displays are eye-catching and intrigue even the casual observer. At the same time, we found that the learning curve for even the most straight-forward programs are dauntingly steep to many would-be users.

In spite of the apparent ubiquity of computers in everyday life most people seem to have an inherent reluctance to work with the machine. Observations suggested that this reluctance was not correlated with educational background or authority, faculty members at the college were in many cases as reluctant to "tinker" with the equipment as select people with little or no higher education. Immediate gratification was extremely important in gaining user involvement. If "something happened" with only a minimal number of keypresses or mouse-clicks, then the user is more likely to continue the process. Telling an audience that "you can do that but it will take work" or "it will take a number of steps" seems to be a sure way of losing interest.

This was most apparent with STELLA exercises involving the general public. Participants were initially intrigued by the graphic nature of STELLA programming, but they soon grew impatient with the logic required, and systems involving more than 4-6 steps rapidly led to confusion and frustration. There appeared to be a critical threshold of complexity, after which people tended to "switch off" and stop attempting to follow further discussion. More work is needed in order to better define this threshold and to develop appropriate strategies for mitigating the resulting confusion.

Evaluation of curricular activities took place on a continual basis throughout the project as outlined in the original evaluation plan. All courses offered under the developing curriculum were systematically reviewed and evaluated as they were offered within a four tiered process:

1. Each course was reviewed in mid-term class discussions by students and faculty. Visiting Courses were peer reviewed by all members of Academic Affairs Committee at mid-term.

2. Individual course evaluations were written by all students at the completion of each course. These evaluations were reviewed by members of the core team, the Academic Dean, the Administrative Dean, and the Academic Affairs Committee. Whenever any concerns or recommendations arose, they were noted and appropriate adjustments were

recommended and adopted. Overall, student reactions have been very positive, and this attitude is reflected in the growing enrollments in project related courses.

3. The project as a whole was continuously monitored by the project personnel. These evaluations took place in the weekly meetings of the Center for Applied Human Ecology, and were discussed on a term-by-term basis in the Faculty Meeting --- involving the whole faculty of the college. Assessment of the external dimensions of the project was monitored by the project personnel with major community relations responsibilities (Mancinelli, Cline, Allen, Longsworth). This process relies on direct assessment of community projects in face-to-face meetings with colleagues in the community.

4. Final review and evaluation was conducted by the Academic Policy Committee of the Board of Trustees. Updates of the project have been made at quarterly meetings of the Board, and several presentations of selected aspects of the project have been presented on their agenda.

Based on the overall evaluation of the program, the FIPSE project was incorporated into the college's long range plan to further regional involvement across the curriculum and to use this academic model as the basic template for building the institution's international programs. These decisions were facilitated by the very high degree of visibility surrounding the project from the beginning. Newspapers in the region regularly reported on many of the college-community collaborations and on several occasions the project appeared in national publications.

The general collaborative approach inherent in this project was also utilized by the college in the creation of a state wide ecological - economics initiative (ECO/ECO Forum), which has brought together heads of businesses, environmental organizations and regulatory agencies. This highly successful venture has brought a great deal of attention and credit to the College.

All members of the project team have been very active in dissemination activities. Progress and research reports based on the project have been presented at the Sixth and Seventh International Conferences of the Society of Human Ecology (Utah and Michigan) and at the Fourth World Academic Conference of Human Ecology in Mexico. Papers presented at these meetings have all been published.

The products of the computer lab are constantly on display to visitors at the college, and are regularly featured to visitors and in the Northeastern Environmental Studies Program Directors' meeting held at COA in Spring of 1993.

The Town Planner of Bar Harbor --- who has played an important role in FIPSE-related activities --- asked COA to host the Northern New England meeting of the American Planning Association on campus as a way of recognizing our achievements and giving demonstrations.

Other significant dissemination steps include: presentation of graduate student Scott Dickerson's Master's thesis at the National Conference of the Land Trust Alliance; the donation and installation of a GIS system at the Multiversidad Franciscana de America Latina in Montevideo, Uruguay by the project director, John Anderson and COA student Becky Aubrey; the teaching of a course on GIS applications at the Multiversidad; invited presentations at the Chinese Academy of Sciences by Richard Borden, project co-director; and joint presentations by Isabel Mancinelli, Richard Borden and Paul Haertel, superintendent of Acadia National Park, in response to a special invitation from the government of Trinidad. A summary of the project has appeared as a chapter in a recent book, Pathways to Human Ecology, published by Lang Press: Bern, Switzerland and other articles written by project managers have been translated into Spanish and Chinese and published.

The project thus served not only to crystallize the opportunities within the college and the immediate surrounding community, but also to provide an important symbolic and practical catalyst among statewide, national, and international parties with similar interests and who are facing comparable problems.

F. SUMMARY AND CONCLUSIONS

Our experience clearly demonstrates that computerized tools for planning and decision making can be utilized effectively both within an academic setting and in the "real-world" environment --- provided that all parties involved agree on basic assumptions and ground rules. Within the academic setting the importance of adequate preparation, including a depth of understanding of the complexity of related factors, is essential if the computer tool is not to serve as a distraction, or, in a worst-case scenario, to lend a degree of authenticity to questionable data.

Computer software, especially programs that use graphic metaphors for displaying information, lowers the initial threshold that must be crossed by users wishing to integrate information from a variety of sources. Familiarity, skill, and "comfort" with the tools do not seem to follow any specific curve over time. Rather, individuals seem to reach discrete plateaus in each factor, within which they are willing to say "I know" "I use" "I understand" but beyond which they rapidly retreat into confusion and disenchantment. There is a fine line between "This is a marvelous tool that allows me to see relationships that I had never been aware of" and "This entire exercise is a waste of time and effort and you can't trust machines anyway".

Whereas in any situation there will exist an ultimate condition of information overload and unbearable complexity, techniques exist to reduce the likelihood of this becoming a pathological situation. We feel that adequate preparation, as outlined in the curriculum in Applied Human Ecology (above) is likely to both raise the ultimate plateau of knowledge that students will reach and decrease the likelihood of withdrawal.

Critical elements in successful education and model building (indeed it can be argued that education is model building in its most fundamental form) include knowing what can be safely left out, as well as what must legitimately be kept in. Given the impossibility of including absolutely every factor likely to affect a given situation, it is important to recognize that a degree of probability will ultimately govern any activity. Many people --- including students, faculty, and non-academics --- feel extremely uncomfortable in the presence of uncertainty. Computers provide a pleasant sense of rigor and precision that is highly seductive in the face of an uncertain and changing world. It is extremely important to steer participants past the Scylla of determinism ("this is the only way things can come out") without at the same time wrecking them in the Charybdis of improbability ("Murphy was an optimist, if it can happen this way, however unlikely that may be, it invalidates all our knowledge and we can do nothing"). With sufficient confidence in one's personal knowledge base individuals and groups can navigate through uncertainty to a useful compromise, however this will take time and patience on the part of a teacher or other facilitator.

A final lesson from the project is to beware the solution looking for a problem. Just because a computer can do something does not mean that it ought to. Many of the exercises that we ran with either GIS or STELLA could have been done much more quickly and effectively by hand or through a few minutes of conversation. There is a tendency to allow the tool to become the master of the process, and all discussions may be forced to fit within the framework required by the tool. This ultimately leads to general dissatisfaction with the entire process and a general lack of closure.

Computer tools may be most effective at the beginning and at the end of the process. At the beginning they can generate "talking points" that initiate a discussion of important factors or areas in need of research; and at the end they can provide valuable mechanisms for display and interpretation of conclusions. They cannot, however, run the entire debate. Without sufficient initial preparation and a degree of flexibility throughout, computerized tools can be marginalized or even counter-productive. If, on the other hand, an appropriate application is determined, and participants have the patience to deal with the weaknesses as well as the strengths of the tool, then they can be an extremely valuable asset in decision making.

G. APPENDIX

The most valuable assistance that the FIPSE staff provided was their flexibility and willingness to accept changes in initial timetables and plans as the project developed. This allowed project staff to truly experiment with different techniques and to adjust the program to meet new or unexpected needs as they developed. We feel that this is a critical element in the encouragement of innovative forms in education. Many projects are undoubtedly only partially formulated at the time of proposal, and faculty and other participants need to be able to maintain the ability to shift emphases and resources in response to needs that may only become apparent as a result of preliminary work.

Future proposals in this area should take into account the prolonged "ramp-up" time needed to initiate any projects involving either personnel beyond the immediate academic environment or high-tech innovations. Combinations of these two factors may lead to frustrating delays initially as schedules and process mastery proceed at their independent paces. Grant directors should build in extra training time both for particular software/hardware elements and simple group-dynamics. Teams should be encouraged to work together on relatively small components of a given project prior to undertaking major and complex tasks. This sort of "pre-conditioning" can ease many of the stresses that project development can otherwise initiate.

In spite of the increasing commonness of computers in both the academic and business world, most users are familiar with at best only a handful of programs and commands. Shifting to a new system or software package can be traumatic, and this degree of trauma is by no means limited to naïve users. "Old hands" at computers may be reluctant to experiment with new or different ways of doing something, and additional time may be needed to break them of their habits. Regular assessment of progress and the relevance of techniques to given problems are essential components of any successful project.

COA students explore housing options

by David Warren

BAR HARBOR — A pragmatic approach to affordable housing was offered in a presentation by the Advanced Land Use Seminar at College of the Atlantic, Monday.

The term-long study focused on land use as it relates to affordable housing on Mount Desert Island.

One group of students surveyed MDI employees on their housing needs and preferences; a second examined the impact of current land-use regulations on affordability; while a third presented a site- specific plan for affordable housing.

A majority of the 204 respondents felt that affordably priced housing was difficult to find. For many year-round residents, the cost was so much that housing would have to eventually be found off-island.

Respondents cited rental rates and property taxes as two of the reasons housing costs are unaffordable.

Ken Cline, who taught the seminar with Isabel Mancinelli, appreciated the receptiveness of respondents.

"To the credit of the people who were surveyed, they were interested in the possibility of incorporating affordable housing into the current landscape."

In regard to land-use regulations, the class found that space is relative to cost, meaning the higher the residential density the lower the price tag. The suitability of a site for affordable housing was based on access to water, connection to a town sewer, road access, and other critical areas, such as the possibility for development, valuable agricultural land, and erosion.

The Advanced Land Use Seminar at COA offered an alternative view to affordable housing. This model shows cluster zoning with free zone ordinances applied. WARREN PHOTO

Floating zone subdivisions were one option the class presented for affordable housing. The main, or parent, parcel would be no more than five acres, a larger site being antithetical to the project's conservation purpose, with a minimum-lot size of 10,000 square feet. Road frontage and lot width should not exceed 75 ft. The minimum distance between homes would be 25 ft., with a family lot being 5,000 square ft. The driveway length, which is responsible for the greatest costs, should not exceed 100 ft.

The site chosen by the group to represent an ideal example of affordable housing is in Hulls Cove. It was chosen, in part, because of its proximity to Bar Harbor and closeness to a sewer system that is only at 50% capacity.

The 54-acre parcel of land, which lies a short drive down a road across from the Episcopal Church of Our Father, was developed in models and sketches, with special attention given to conserving as many natural features as possible.

The area was developed according to cluster zoning with single-family homes on their own lots but shared driveways on the five- acre-parent parcel. Shared utilities would help reduce the cost. Three clusters of homes were modeled around a large green that could serve as a recreational or social area. ■

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A.C. Parsons

COA creates database for Acadia

BAR HARBOR — Few places have had their natural resources studied as intensely as Acadia National Park and other areas in Down East Maine. A computer database cataloging all research articles written about the natural resources of the area will make the information more readily available.

Created by College of the Atlantic, the catalogue will be a research tool for researchers and managers.

"Because Acadia has been the focus of many naturalists' studies over the past 150 years, the natural history of Mt. Desert Island may be the best known of any area of comparable size on the continent," says COA biologist Dr. Craig Greene. "But up until now, no comprehensive bibliography of this information has existed."

Greene and three COA graduates developed the database. The accumulated information will serve as a foundation for future inventory and monitoring efforts in the park.

"In providing a clear picture of what is known about park resources," the biologist says, "this project will aid in developing the best inventorying and monitoring strategies for natural resources in Acadia National Park."

The index is organized by region, species, date, author and other key information. It provides an annotated summary of each of the more than 1,000 research articles that have been written on the park, some of which date back to the 1800s.

Research associates Glen Mittelhauser, Jamien Jacobs and Linda Gregory, under Greene's direction, spent over two years contacting researchers and poring over material in libraries at COA, University of Maine and Acadia National Park.

The database, along with an 800-page bound summary of references, will be kept at the Acadia National Park headquarters on MDI. Similar projects are being developed at other national parks in the United States.

The database is the latest of several projects carried out for the National Park Service, North Atlantic Region, by COA under a cooperative agreement between the two groups. Other projects have included the reintroduction of peregrine falcons to the park and the study of rare and endangered flora of MDI. □

Briefs

3-5-92

■ BAR HARBOR

Gates Center approved — The College of the Atlantic has been given the go-ahead to build the Gates Community Center, an 8,300 square foot building that will include a 300-seat auditorium and faculty offices. On March 19, the Bar Harbor Planning Board voted unanimously to approve the building, ruling the project will have a negligible effect on Eden Street's beleaguered sewer line.

Dallas Darland, vice president for development and external affairs , said COA has so far raised $1.25 million of the $1.75 million needed to fund the project. He said COA is waiting to hear about "a couple major foundation grants" that could raise the additional $500,000, and that as a rule the college doesn't break ground for projects until they are completely funded. Millard Dority, the director of building and grounds at the College, says he hopes the college completes at least a frame for the building before next winter.

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COA volunteers work with Maine Heritage Trust

by Laurie Schreiber

BAR HARBOR — Two students from College of the Atlantic put their academic studies to work recently, when they volunteered to help Maine Coast Heritage Trust with its "island conservation initiative," a project to compile "adequate data on islands' ecological, scenic, cultural and historical resources," according to their spring bulletin.

Tim Case and Pat Watson, third-year students at the college, studied islands in Frenchman and Penobscot bays.

"We took a study area of about 300 islands and began to put them on databases at COA," explained Case.

Working for the trust does not always mean getting out under the open skies, said both students. A lot of their study involved office work.

"I went around for four months to town offices looking for landowner information, and to local land trust offices looking for information," said Case.

Watson agreed. "I did a lot of office things — looking at tax maps done by government agencies to see what protection an island might have. Tax maps tell you who owns the islands, what it's worth, the buildings on the island. We were building a database, so the trust could look at it later and contact people about conservation."

Maine Coast Heritage Trust's mission is to protect "land that is essential to the character of Maine, its coastline and islands in particular," according to its bulletin, and to provide conservation advice to landowners and local land trusts. Last year, the trust assisted landowners on Mt. Desert Island to place "conservation easements" on their properties, a legal tool allowing landowners to retain ownership of the property but place permanent restrictions on its use and development.

Case said working for the trust was a good opportunity for "hands-on land use management."

"If the trust is looking to protect a certain island," Watson said, "they would probably contact the landowner and a nearby trust if there is one. They would talk with the landowner and see if they might consider putting the island under conservation."

But the islands were not all on paper for the two.

Occasionally, "we did a field survey to get a flavor for the features" of the islands, said Case, adding that such features might include "what kind of habitat there is, whether there's a mature forest or not, bald eagle nests, what they look like."

Case also participated in an aerial survey.

"We spent a day photographing major islands. You can learn a lot in one photo about their development. A lot of islands close to towns have at least one or two houses. That can be critical for the habitat."

Even the presence of one dog, Case said, could "pretty much kill the indigenous habitat," frightening off sea birds, for example.

Watson agreed that any development could endanger an island.

"Someone with enough money would probably love to live on an island. There are a lot of big homes [on the islands]. Just building there has a major impact, cutting enough room to build a house or yard. And the islands aren't very big."

Asked why development constituted not merely impact but actual endangerment, Case said his experience with the trust enabled him to form an opinion on the matter.

"It's become increasingly apparent, especially Down East, that the wave of coastal development will increase. The majority of the islands are owned by some out-of-state and certainly out-of-town owners. The relationship between island owners and the local [mainland] community is such that [island owners] don't care about the habitat."

Case cited one small island in Pleasant Bay "owned by an out-of-stater who put quite a substantial home there. From the planning standpoint, it's out of character with the rest of the town. The magnitude of any single effect on the mainland may not affect much, but on an island, it's different."

There are currently three other volunteers working with the trust, according to Caroline Pryor, the trust's vice president.

"Alison Armstrong is doing a project in the library, cataloguing items. Leslie Jones is doing a legal project with our attorney, cataloguing examples of restrictions that appear in conservation easements. Her product will be a menu of different examples of restrictions, meant to be a technical tool for attorneys and other trusts.

"Forrest Dillon is collecting information about properties we're working on, doing maps, taking photos."

The volunteers' hours range from two to 20 or more, said Pryor, depending on the individual's interest.

"When someone expresses an interest, we find out what their interests are, what they're skills are or what skills they'd like to develop," she said.

While training and supervising volunteers can take time, said Pryor, there are many projects, ranging from clerical to field work, that need them. And in some cases, as with Case and Watson, a volunteer may get to the point of working independently.

"[Watson and Case] quickly mastered the work. They went out on their own and actually represented the trust," Pryor said.

Watson said he will continue with his conservation studies, while Case said his concentration is in design and public policy. A landscape designer "in real life," Case said his work allows him to "take small actions with people's homes. If you want to look at the state of the world, we need to look at more regional issues. Community planning and public policy tend to be abstract. But COA pushes people to be practical, and that's also what drew me to the trust."

Begin at the beginning ... and go on till the end: then stop.

— Lewis Carroll

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SEPTIC PUMPING

Long Pond water quality study completed

Unacceptable levels of fecal coliform found at some testing locations

By Kathy Harbour
Of the NEWS Staff

MOUNT DESERT ISLAND — Those who have their water tap directly tied in to the north end of Long Pond in Pretty Marsh may want to think twice before they drink any unfiltered water.

A just completed water quality study of several freshwater lakes on Mount Desert Island has found unacceptable levels of fecal coliform at some testing locations at that end of Long Pond.

An unacceptable level of fecal coliform was also identified at one location on Echo Lake, toward the middle in the southern end. The south end of Long Pond and other lakes tested this summer received a clean bill of health for levels of fecal coliform.

According to Carolyn Reeb, the summer intern who conducted the study for the MDI League of Towns, camps that take water from the northern part of Long Pond without filtering it "could be facing a health risk."

An engineer with the Department of Human Services' Drinking Water Program explained recently that fecal coliform can make people sick, as waterborne viruses can pose potential dangers.

Reeb said the level of fecal coliform found at locations on Long Pond could be tied to the number of camps situated on the shore of the pond. She explained beaver and pet waste, not just human waste, can also attribute to fecal coliform pollution.

Mount Desert Town Manager Dick Vander Zanden said this week the town is working to identify and correct any faulty septic systems located around Long Pond. A shore survey has already identified about 15 faulty systems that have been or will be replaced.

He said a source had also been identified on Echo Lake, and that a correction was being made.

Popular swimming holes are situated at the north end of Long Pond and at the southern end of Echo Lake. Reeb said the data collected this summer cannot be used to determine whether the water is unsafe for swimming. She recommended that data should be collected next year.

Reeb conducted several tests on each lake, with two test periods in July and another in late August. In addition to testing for unacceptable levels of fecal coliform, Reeb took temperature readings, measured the turbidity of the lakes and ponds, and sampled for phosphorous levels.

All the lakes, she reported at this week's MDI League of Towns meeting, have acceptable temperature profiles. Each also falls within the acceptable ranges in Maine for phosphorous.

The lakes tested this summer, in addition to Long Pond and Echo Lake, were Jordan Pond, Bubble Pond, Eagle Lake, Upper and Lower Hadlock Ponds, Seal Cove Pond, Little Long Pond, Somes Pond, and Hodgdon Pond

Reeb's other work included compiling information about tests previously conducted on the lakes by such agencies as the national park, Dept. of Marine Resources, the Shellfish Council, and College of the Atlantic.

Even though some data is available, she explained, there is not enough to make definitive conclusions about trends in the water quality over a number of years. If the study is conducted and expanded in following years, trends may emerge, she said.

Results of the water quality study will be reviewed at the upcoming Islandwide Elected Officials Meeting scheduled for 7 p.m. on Monday, Nov. 30, at the Somesville Fire Station.

The revised bylaws of the Acadia Disposal District will also be discussed at the meeting

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by David Warren

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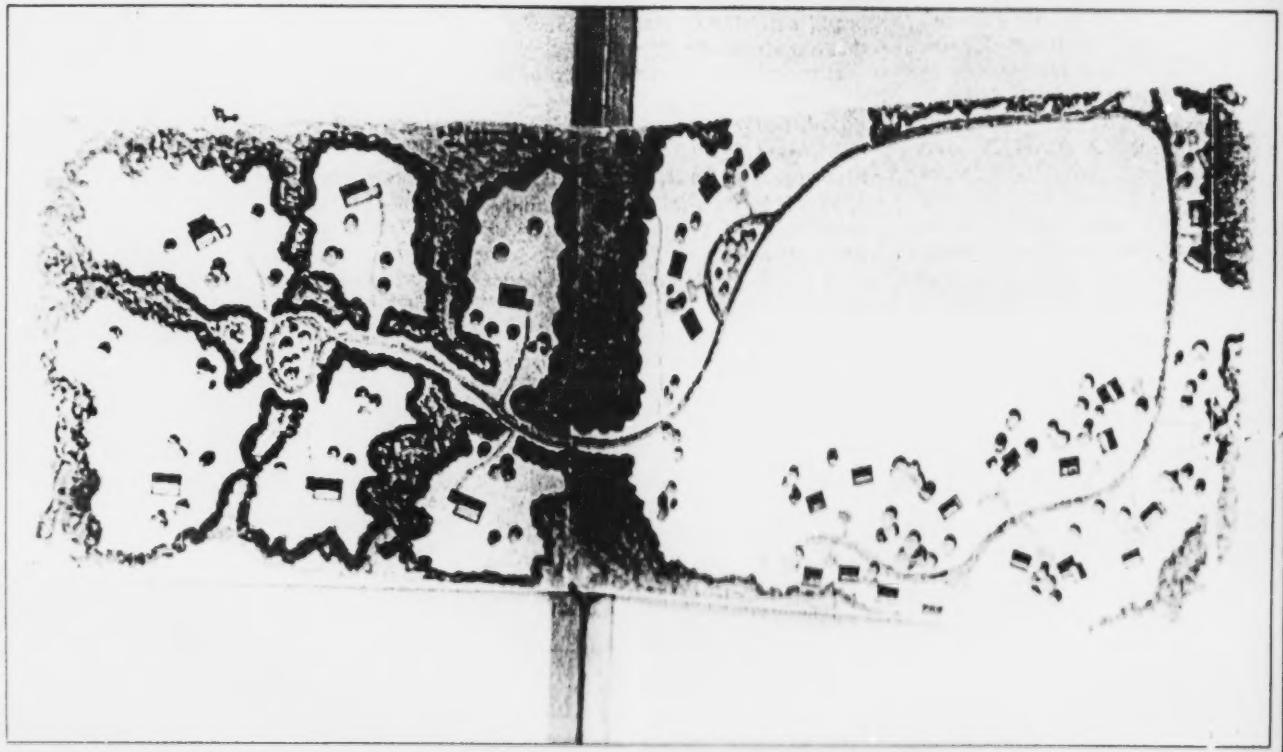
"To the credit of the people who were surveyed, they were interested in the possibility of incorporating affordable housing into the current landscape."

In regard to land-use regulations, the class found that space is relative to cost, meaning the higher the residential density the lower the price tag. The suitability of a site for affordable housing was based on access to water, connection to a town sewer, road access, and other critical areas, such as the possibility for development, valuable agricultural land, and erosion.



The Advanced Land Use Seminar at COA offered an alternative view to affordable housing. This model shows cluster zoning with free zone ordinances applied.

WARREN PHOTO

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Bangor Daily News, April 8, 1993

Heritage Trust, COA to focus on peninsula

BLUE HILL — Blue Hill Heritage Trust has teamed up with College of the Atlantic to work on conservation priorities for the Blue Hill peninsula.

Pat Watson, a senior at the Bar Harbor college, is working under the supervision of the trust's consultant, Ben Emory, to identify key areas for attention by the trust.

The conservation group works in the towns of Blue Hill, Brooklin, Brooksville, Penobscot, Sedgwick and Surry. In those towns, Watson will be pinpointing productive farm and timberland, good wildlife habitat, scenic vistas, land accessible for outdoor recreation and education, land important for protecting water supplies, and other lands critical to the character and culture of the communities.

After identifying the key properties, the trust will approach landowners and encourage them to consider conserving the important features of their land. The group is equipped to explain to landowners how to protect their lands and can help them in the conservation.

For Watson, this undertaking is his senior project and will complete his academic requirements at College of the Atlantic. He is working on behalf of the trust full time this spring in lieu of all course work.

Anyone having suggestions for areas that should be noted on the list of conservation priorities is encouraged to contact any board member of Blue Hill Heritage Trust or write the trust at P.O. Box 222, Blue Hill 04614.

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The Bar Harbor Times

February 28, 1991

League of Towns to aid land use data

by LaRue Spiker

MT. DESERT ISLAND — Local comprehensive planning committees will be given a big lift toward completing the information they need by a project approved by the MDI League of Towns last week.

The action was taken after a presentation of the proposal by Planners Isabel Mancinelli of Acadia National Park and Jon Lockman of Bar Harbor.

The project will consist of coding resource and land use maps already available or in process of development so that local planners can answer questions concerning natural resources and land use almost at a glance. Mancinelli said that the cost will be about $10,000 made available to this area by the National Park Service.

The coding will be applied to computerized maps already available at the College of the Atlantic, the Maine Coast Heritage trust, and soil maps being developed by the Frenchman Bay Conservancy in cooperation with the University of Maine at Orono.

The color coding with written description is a kind of quick identification of the nature of any given factor at a given place. It will make the information on the maps much more accessible to the people using them and can serve as a basis for zoning decisions.

Mancinelli said that the maps will be complete for all the natural resources information needed for decision-making except for information on wetlands, which is still undone.

The maps at COA are called the Geographic Information System. They include the shorelands, hydrology, roads, boundaries, tax parcels and vegetation.

The MCHT maps were derived from a survey of island resources. They include information on scenic resources, vistas and significant natural cultural resources.

In other business the league consulted with a number of resource people con-

■ see LEAGUE page A12

LEAGUE ■ from page A9

cerning problems related to septage disposal. The resource people included Steve Page of the Department of Environmental Protection; Dana Nelson, Resource Conservation and Development; Thomas Merton, Hancock County Planning Commission; and Gerald Kanke of the Maine Rural Water Association.

Page said that as of April 1 all people who pump septage from private systems must be licensed with the point of origin and point of disposal registered. He said that there are 90 licensed disposal sites in the state, but 25 percent of the towns cannot find suitable sites that are cost-effective.

He added that spreading the septage on open areas is the most cost-effective and is safe if done properly. Sludge from treatment plants and septage are not compatible for such disposal. He suggested that the local communities set up a task force to study the problems here.

Bar Harbor Town Manager Dana Reed said his town has recently modified its sewage treatment plant so that it can now accept septage as well as sewage. The end product is sent to the treatment plant in Hulls Cove where it is composted. The material is treated for heavy metals and tested monthly. The end product is good fertilizer and people are free to help themselves at the Hulls Cove site.

Tremont has a contract with the Winter Harbor system to accept septage from private pumpers.

Mt. Desert accepts it at its sewage treatment plant.

Southwest Harbor's treatment plant is not suitable for accepting septage, and the town needs a better resource than its present system. Reed said that Bar Harbor is interested in exploring cooperative agreements with other towns for septic disposal.

Reed announced that Bar Harbor Town Council is not interested in the two recycling proposals submitted by Eastern Maine Recycling (EMR), primarily because of cost.

Mt. Desert Town Manager Richard Vander Zanden said that his board of selectmen had been forced to do some rethinking on the proposals because of budget problems.

EMR Vice President Lee Worcester was present at the meeting. He said that he would probably rework the proposals on an item by item basis. He would present new proposals, which would be a bare bones program, later.

He added that he wishes he has "a better framework with Bar Harbor." The recent decision, he noted, had all been worked out without any consultation with him. □

And see! she stirs!
She starts—she moves—she seems to feel
The thrill of life along her keel.
—Henry Wadsworth Longfellow

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College of Atlantic Hosts Northeast Environmental Program Directors

BAR HARBOR—The College of the Atlantic hosted the 1993 Northeast Environmental Studies (NEES) program directors' annual meeting on April 30 and May 1. Program directors from as far away as Kansas and Washington, D.C., gathered to discuss environmental issues in higher education. The conference was organized by Academic Dean Richard Borden and Alesia Maltz, director of advanced studies.

The theme of this year's meeting was "Colleges Working with Communities: Environmental Justice and Environmental Poverty." The keynote speaker at Friday's dinner was Dr. Beverly Paigen, a senior scientist at The Jackson Laboratory and a founder of Citizens' Clearinghouse for Hazardous Waste (CCHW).

In her talk, Dr. Paigen recounted her experiences as a faculty member and master at Rachel Carson College at SUNY Buffalo. She and her students were instrumental in discovering and documenting the Love Canal site. Dr. Paigen described the environmental hazards that the industrial dumping in Love Canal posed to the children living in the area. She also condemned social and environmental scientists—many of whom are university-based—who have cooperated with industry and corporations to identify areas where the residents are poor and uneducated and are thought by the companies to be less likely to object to dumping. At the end of her presentation, Dr. Paigen received a standing ovation.

At Saturday's meeting, several program directors described how their institutions have been working with local communities to address environmental problems. Of special interest to participants was a report on the successful relationships that College of the Atlantic has established with Mount Desert Island communities based on cooperative research and Geographic Information System (GIS) mapping and planning.

The Northeast Environmental Studies group has been working as an informal exchange network among higher education programs for the last 10 years. Founding members include representatives from established environmental programs at Brown, Williams, University of Vermont, Tufts, Yale, Dartmouth, and College of the Atlantic.

Participation in the group has increased in recent years as other colleges and universities have adopted environmental programs. Coordinators from newer environmental studies programs, such as those at Harvard and Middlebury, attended this year's meeting. Next year's conference will be held at Colby College.

THE ELLSWORTH AMERICAN, ELLSWORTH, MAINE 04605

Thursday, May 13, 1993

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When B&A bought property it wanted Sears Island as park

By Wayne E. Reilly
Of the NEWS Staff

Franklin Cram's plans for Sears Island oddly coincided with Kenneth Cline's 90 years later with one important exception — Cram wanted to make a profit.

Cram was president of the Bangor & Aroostook Railroad. Cline is president of the Maine Group of the Sierra Club. Today the interests of the B&A, which has been an active supporter of the industrial development of Sears Island, and the Sierra Club, which has unleashed an arsenal of legal weapons to block it, are diametrically opposed.

The latest chapter in the 940-acre island's history began back in 1903 when the B&A began buying land in Searsport to establish an ocean terminal, according to Joel Eastman, the island's historian.

The railroad built terminals in three separate locations including Mack Point where a coal terminal, freight yard and engine house were erected, wrote Eastman in "A History of Sears Island." Mack Point is still the site of a B&A cargo dock and tracks. It is also the preferred site for cargo port expansion by opponents of the Sears Island plan.

In 1905 the railroad purchased Sears Island for $55,000 from the Sears family, who had summered there for generations. Cram had summered in Searsport for years, and he recognized the potential for recreational development that would generate traffic for the railroad — just like shipments of lumber and potatoes headed for the sea from Aroostook County. The railroad already had built a station and steamboat wharf at Kidder Point from which a new federally funded causeway stretches today to the island.

First, the railroad moved to develop a recreational park on Bar Point, perhaps looking on the island as the second stage of development, speculates Eastman. The railroad ran excursion trains to the park.

PRISCILLA CHAPMAN, executive director of the Sierra Club's New England Chapter, and Kenneth Cline, president of its Maine Group, leaders in the fight against a Sears Island cargo port.

The park shut its doors in 1927 after the automobile revolutionized travel, killing the park and any plans the railroad had to turn Sears Island into a summer resort.

Over the years "the island's history as a prosperous farm ended, the island gradually reverted to an almost natural state, and the hikers, hunters and picnickers came to view it almost as a public preserve," wrote Eastman.

Beginning in 1960, major proposals to develop the island — this time with heavy industry — surfaced. Companies proposed building an aluminum smelter, an oil refinery, a nuclear power plant, a liquified natural gas plant, a coal-fired plant and a coal gasification plant. In 1969 the Amoskeag Co. bought the railroad and the Bangor Investment Co., the subsidiary that owns the island.

In the mid-1980s the company sold 40 acres of the island to the state for a cargo port.

The cargo port proposal raised the concerns of Massachusetts residents Betsy and Frederick Fawcett, whose summer house faces the site. Betsy, a Sierra Club member, referred the matter to Priscilla Chapman, executive director of the New England Chapter of the Sierra Club. She referred it to the executive committee of the Maine Group. It voted to adopt the issue.

One gets a sense of deja vu when talking to Kenneth Cline. While his motives aren't the same, he sounds like Franklin Cram might have sounded talking about the island's potential in 1905.

"In an ideal world this would make a pretty nice park," said the professor of environmental law and policy at College of the Atlantic.

Ironically, the B&A's preservation of the island for nearly a century is the reason Cline's group still has a crack at preserving its natural beauty.

Cram's successor, Walter Travis, is still interested in turning a profit. Sears Island has tremendous development potential today, says the current president of the B&A, which wants to move cargo from the proposed port.

It could mean hundreds of jobs for economically depressed Waldo County.

But Cline says, "If they are ultimately successful with what they want to do, Penobscot Bay will be changed forever. For those of us who think there are lots of ports, but not lots of Penobscot Bays, that's a sad loss."

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Commission considers impact of easements

Easements affect economy, development

By Kathy Harbour
Of the NEWS Staff

TREMONT — Although recommending acceptance of a 10-acre conservation easement on Sutton Island, several members of the Acadia National Park Advisory Commission signaled again this week their rising resentment toward the growing number of prime parcels held by the park as easements.

Consideration of the potential economic impact of conservation easements on the local tax base has dominated discussion at the advisory commission for the past several meetings.

Some members insist local towns will be the future losers as more properties are held by the national park as easements. Even though some easements allow for limited development, several commission members contend that even limited development could mean a loss in property taxes on properties that might eventually have been used for more expansive development. Others say their communities fear encroachment by the park as more properties are held as easements.

On Monday, the commission recommended the park accept a 10-acre parcel owned by the Rosenthal family on the shore of Sutton Island, property that lies in close proximity to another shorefront parcel the commission recommended as a conservation easement last December. On recommending acceptance of the Rosenthal easement, it was noted that elected officials on Cranberry Island had taken no position on the easement, but that they had raised general questions about the future effects of easements on the tax base.

Farnham Butler, a member of the advisory commission who has been vocal in his objections to park-held easements, contended on Monday that any shorefront parcel seems to be considered fair game for acceptance as a conservation easement by the park.

"If a piece of property is on the water somewhere, it's (considered) for inclusion," Butler said.

Butler said he and the Mount Desert tax assessor had determined the town potentially could lose up to $7,000 in property taxes each year on a property that could have been divided and developed but was held as a conservation easement without development.

Commission member Albert Gray argued that the park should not be in the business of accepting easements. "Most of these are not contiguous to the park ... and restrict public access. It doesn't do the park one bit of good. The park doesn't have enough money to take care of what they've got as it is."

Superintendent Bob Reynolds explained that conservation easements are in a different category from land included within the boundaries of the park, and that the national park has been given permission to accept easements through legislation. "Preservation of natural, scenic values ... has been deemed to be in the public interest," Reynolds said.

Property that can be considered for easements must meet criteria outlined in the boundary legislation, criteria that include consideration of the scenic, ecological, historic, archaeological and cultural values of the property. According to Reynolds and other park personnel, many offers from landowners are rejected because the parcels do not satisfy the criteria.

Some commission members have argued at past meetings that landowners have the right to protect their land in perpetuity and have said it is inaccurate to equate acceptance of easements as encroachment by the park.

Last summer, the commission agreed that an objective and independent study should be conducted on the potential impact of conservation easements on the local tax base, but plans for the study were rejected when it was found to be "too speculative and expensive," according to Reynolds.

The superintendent explained Monday that any study on the future impact on the tax base of a piece of property held as an easement would have to include assumptions about development in that area and about the future itself. However, the park will be working with a College of the Atlantic student this summer to conduct a limited and more focused look at the impact of easements.

In that study, the economic impact of two types of conservation easements in the town of Tremont will be considered. One easement is a "forever wild" easement; the other, one that allows limited development.

According to Lee Worcester, chairman of the commission, "We need to find a way of convincing ourselves whether our concerns are reasonable or not."

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College forges link with China

BAR HARBOR — College of the Atlantic Academic Dean Richard Borden and Philosophy Professor John Visvader were recently invited by the Chinese Academy of Science to give presentations on sustainable development and human ecology.

The Academy of Sciences in Beijing has just established an Asia-Pacific Center for Human Ecology Training. Borden and Visvader attended the academy's first summer training institute, which included a two-week certification course on sustainable development. The course was attended by Chinese professionals, urban and regional planners, educators in key positions, and government officials who will be involved in development issues and planning.

Professor Visvader's background is in philosophy of science and human ecology, and he is also an expert in Chinese philosophy. His presentations focused on the relationships of Eastern and Western views of science, ecology, and technology.

"I see this collaboration as a wonderful opportunity to get our students involved in pioneering planning in China," said Visvader. A letter of agreement to start student and faculty exchanges has been written. Visvader believes that the development plan formulated by the academy and "Agenda 21" will be "an influential model for the 21st century."

Borden's presentation highlighted the development of human ecology as an educational, research, and applied perspective worldwide. He also spoke about the ways in which COA has been using computer-based technologies, such as Geographical Information Systems (GIS), to facilitate regional participation in development planning.

"China is changing very fast," Borden said. "You can see it everywhere — the old rubbing up against the new." At the same time, Borden notes, there seems to be intense interest in the uses of human ecological approaches to planning for the future. "It was an honor for us to be invited to help launch this scientific and policy program," he said.

The institute is linked to "China's Agenda 21," a white paper on China's population, environment, and development in the 21st century, which was adopted in March, 1994, by the People's Republic of China. The Academy of Sciences has an important role in providing ecological planning advice on a variety of large-scale projects, such as developing a sustainable development plan for northern China and the creation of a 500-square-kilometer nature/recreation area in the Guangdong Province.

The academy has begun to train people in ecological applications, the use of new technologies, and the development of methods of collaborative regional planning. COA's local, state, and international programs in these fields became of interest to the academy when Dr. Rusong Wang, director of the institute, visited here in 1992. ■

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Maine coast grows 600 miles

Researchers have discovered that Maine's rugged coastline is longer than originally thought — about 600 miles longer, in fact.

The latest information provided by Geographic Information System (GIS) computers puts the length at 5,500 miles.

During a project at the College of the Atlantic in Bar Harbor

to map the entire state at a scale of 1: 24,000, new techniques, including the use of exisiting maps, satellite data, and ground observations, enabled researchers to include a level of detail not possible even a decade ago.

Included in the total are all tidally influenced waters from the Piscataqua to the St. Croix River and digitized data on nearly 6,200 islands.

GIS computer programs allow planners and researchers to integrate information about a wide variety of physical and natural features in a given region. Land use activities, wildlife habitat such as salmon spawning areas and eagle nests, acquifers, and even hazardous waste sites can be pinpointed and examined.

The 1:24,000 scale is comparable with the 7.5-minute U.S. Geological Survey topographical maps.

Agencies participating in the mapping effort include the Maine departments of Environmental Protection, Inland Fisheries and Wildlife, and Marine Resources, the Maine Office of GIS, and the Maine Geological Survey.

The project is being underwritten by the DEP's Oil Spill Response program which plans to use the data base to manage information in the event of an oil spill. — Earl Brechlin

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Ellsworth Weekly, May 14, 1994

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The Bar Harbor Times

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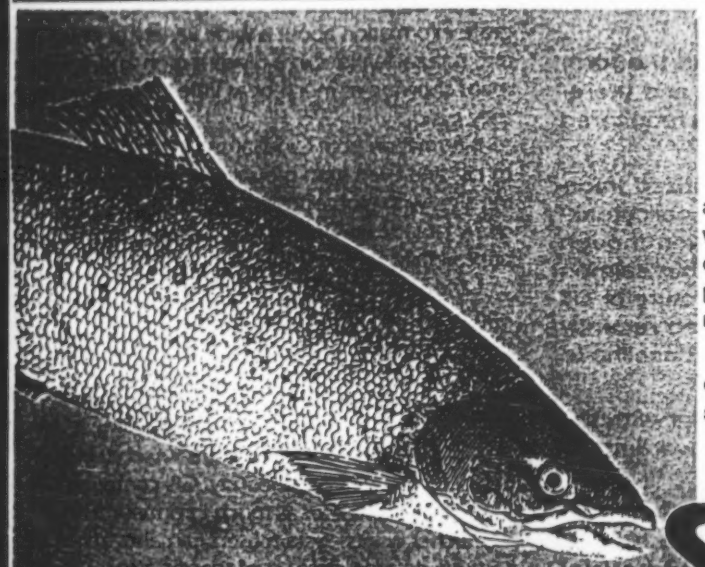
May 5, 1994



Saving Salmo salar

Bringing satellite and computer technology to salmon's rescue

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Story and photos by Earl Brechlin

When it comes to insuring the survival of Atlantic salmon in the Dennys River, computers, satellites, and Scott Dickerson just may be the best friends a fish can have.

As part of his graduate studies at College of the Atlantic, Dickerson has created a Geographic Information System (GIS) map of the entire 140-square-mile Dennys watershed. By combining information on known salmon habitat, human activity, and even the location of three hazardous waste sites, Dickerson hopes to be able to give policy- makers the data they need to better manage for salmon. Some groups are now urging the species be placed on the Endangered Species List.

Located in eastern Washington County, the Dennys gushes forth from Meddybemps Lake and heads south, drinking deep along the way of cold waters from several large aquifers located deep in sand and gravel deposits left behind by the glacier's retreat 10,000 years ago.

The river winds among woods, blueberry barrens, clearcut patches, and settled land before emptying into Cobscook Bay, some 25 miles from its headwaters.

Because of its unique population of wild salmon, the Dennys River is a vital resource important to the survival of salmon in Eastern Maine, Dickerson noted.

Working with Ken Beland of the Maine Atlantic Sea Run Salmon Commission, Dickerson helped catalog vital salmon habitat on the river. Those areas include spawning beds, stretches of water where young fish mature, and deep, cold holding pools where the fish seek refuge in summer before going to sea.

"I spent a lot of time in this watershed getting to know the area in person. The available imagery is nice, but you have to get out there and look at some features in person,"

Scott Dickerson at the GIS computer showing the Dennys River watershed

Dickerson explained.

Once those areas are put into the computer they can be overlaid onto existing topographical maps. Land use activities in the watershed can then be added by blending in infra-red aerial photos and images taken from satellites in low earth orbit.

Once the data is in the computer, Dickerson and others can ask questions about the area.

"We discovered that the major aquifers and the river run parallel to the ocean," Dickerson said, explaining that the gravel deposits are sources of cold water during the warm months.

"This is maybe one reason the Dennys was so productive during pre-Colonial times."

Sitting at his keyboard in the subdued light of the computer lab, Dickerson clicks the computer's mouse to call up different sets of information. Colors spread across the screen as the normal pale blue background color is supplanted by patches and lines of vivid color representing water, roads, vegetation, and structures.

Using the data base, Dickerson was able to ask about forest fragmentation, a key factor in preserving biodiversity and species habitat. The computer showed that there were only eight areas in the entire 140-mile watershed where the forest was unbroken in a circle with a 500-meter radius. The areas show up as a series of occasionally overlapping circles.

All the rest of the woods are fragmented by natural features such as barrens or swamps or manmade boundaries such as fields, roads, and cutover areas.

The GIS maps showed that one major aquifer had been almost totally cleared of trees in the last 10 years following an intense spruce budworm infestation. The white outline of the underground feature glows bright over the other features.

How the clearing of vegetation above the sand affects recharging of the subsurface water will have to monitored, Dickerson said.

Officials know of three hazardous waste sites, shown as red dots in the watershed, including a gravel pit near Meddybemps Lake where transformer oil contain-

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Saving Salmosalar, continued from page B1

Maine coast grows by 600 miles

Researchers have discovered that Maine's rugged coastline is longer than originally thought — about 600 miles longer, in fact.

The latest information provided by Geographic Information System (GIS) computers puts the length at 5,500 miles.

During a project at the College of the Atlantic in Bar Harbor to map the entire state at a scale of 1:24,000, new techniques, including the use of exisiting maps, satellite data, and ground observations, enabled researchers to include a level of detail not possible even a decade ago.

Included in the total are all tidally influenced waters from the Piscataqua to the St. Croix River and digitized data on nearly 6,200 islands.

GIS computer programs allow planners and researchers to integrate information about a wide variety of physical and natural features in a given region. Land use activities, wildlife habitat such as salmon spawning areas and eagle nests, acquifers, and even hazardous waste sites can be pinpointed and examined.

The 1:24,000 scale is comparable with the 7.5-minute U.S. Geological Survey topographical maps.

Agencies participating in the mapping effort include the Maine departments of Environmental Protection, Inland Fisheries and Wildlife, and Marine Resources, the Maine Office of GIS, and the Maine Geological Survey.

The project is being underwritten by the DEP's Oil Spill Response program which plans to use the data base to manage information in the event of an oil spill ing carcinogenic PCBs was spilled.

Remove all the vegetation and road data, and the red dot stands out on the edge of a vital aquifer.

Dickerson said experts have said the form of the chemical is not water soluble and therefore not a threat. But, it will have to be monitored in the future.

According to Dickerson, the digitized information on the Dennys will now allow policymakers to craft better decisions. And, even though they have no way of knowing what other salmon survival factors such as water temperature or silt levels were in 1620, the data collected recently and included in GIS provides a good baseline to measure future fluctuations.

Officials have been pleased so far with the results and may do a similar project involving the Narraguagus River in the near future.

The key, according to Dickerson, is to use the GIS information to help promote human activity while preserving important natural resources. "Now we can see how lands really fit together," he explained.

More often than not, GIS is showing that the key geological and biological features involved seldom follow political borders.

"GIS gives us a better tool for managing information," Dickerson said. "It shows that a broad range of uses can be allowed. Certainly, some lands need to be managed to promote biological diversity, but we can also see how to allow human beings to make a living off the land." ■

How GIS works

Geographic Information System (GIS) computer programs allow planners and researchers to integrate information about a wide variety of physical and natural features in a given region and create maps showing as much or as little information as they need.

Information from LandSat satellites, existing maps, and even from ground observers pinpointing sites with global-position-system units that show latitude and longitude on a handheld unit are carefully entered into the computer.

Land use activities, wildlife habitat, aquifers, and even hazardous waste sites can be pinpointed and examined.

The 1:24,000 scale is comparable with the 7.5-minute U.S. Geological Survey topographical maps.

But, unlike conventional maps which show all the information simultaneously, GIS computers can display as little or as much information as a researcher wants. System users can also "zoom in" to get a detailed close-up of specific areas.

When several types of data are needed, the computer precisely overlays the data in its memory banks.

Instead of terrain data and roads, for instance, the computer can create a map showing only waterbodies, aquifers, and forest cover.

With a keystroke, other information can be added, or just the required data can be printed out on a plotter.

On Mount Desert Island, GIS maps created by College of the Atlantic students have been used in a variety of municipal planning situations in several towns.

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EDUCATION

Edited by Letitia Baldwin 288-3311

COA forges Uruguay tie

BAR HARBOR — A College of the Atlantic student and faculty member next fall will travel to Uruguay where they will set up a Geographic Information Systems (GIS) lab at an educational institute in the capital city of Montevideo.

In her third year at COA, Rebecca Aubrey has already completed a base map of Uruguay. The GIS lab in Montevideo will be used to conduct research on wetlands conservation and management and coastal planning. Aubrey has also translated the commands for the GIS software into Spanish. She and Anderson will help train students and faculty to use the technology.

"This partnership will be an important link in developing our Caribbean and Latin American studies program," says Richard Borden, the college's academic dean. "Through this project and other efforts, important international leadership opportunities will become available to COA students."

Eduardo Gudynas, academic coordinator for the institute, *Multiversidad Franciscana de America Latina*, recently visited COA to meet with faculty and students to discuss the establishment of a GIS laboratory.

The multiversity was started in 1989 as an alternative to the traditional Latin American university where, says Gudynas, "knowledge is compartmentalized and there is almost no relationship between the different disciplines." Like College of the Atlantic, the multiversity takes an interdisciplinary approach to teaching and has a strong environmental program. It also offers a masters degrees in ecology and theology, the latter being recognized by the Vatican.

According to Gudynas, GIS technology is currently in use in Uruguay, but has not been applied to environmental research. The COA system will be used to help manage the wetlands of Rocha, a major breeding area for birds, some of which are endangered.

The Rocha wetlands are of international concern to conservationists. Some of the wetlands have been drained to create rice fields, with 90% of the rice grown for exportation. ■

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COA, Uruguay to work on wetlands management

BAR HARBOR — A Uruguayan educator recently visited College of the Atlantic to discuss the establishment of a Geographic Information Systems laboratory at his institution.

According to Eduardo Gudynas, academic coordinator for the Franciscan Multiversity of Latin America, the GIS technology is currently in use in Uruguay, but it has not been applied to environmental research. The system at COA will be used to help manage the wetlands of Rocha, a major breeding area for birds, some of them endangered.

The wetlands of Rocha are of international concern to conservationists. Some of the wetlands have been drained to create rice fields, with 90 percent of the rice grown for exportation.

Gudynas hopes that COA and the multiversity will address economic considerations in their studies of the wetlands management.

COA officials are excited about the project. "This partnership with the multiversity in Uruguay will be an important link in developing our Caribbean and Latin American studies program," Richard Borden, COA academic dean, said in a prepared statement.

Bangor Daily News, 5/16/94

Viewpoint

Support the comprehensive plan

by Heather Dority

I grew up in Bar Harbor and, for a long time, took for granted that the town had many beautiful areas that had been preserved for the enjoyment of all.

I only recently became aware that this beauty existed because, throughout this century, the town has voluntarily protected its unique character and its fragile island ecosystem.

The first comprehensive plan was passed by the town in 1907, and, since then, the plan has been updated three times — in 1948, 1961, and 1980.

After transferring from a college in Ohio to the College of the Atlantic, I became increasingly interested in land-planning issues. This summer, I had the wonderful opportunity of working with Anne Kozak, Jon Lockman, and Rob Macomber on the final draft of Bar Harbor's most recent comprehensive plan — a plan which will serve as the framework for long-range planning within the town.

I am proud, not only that our town has taken such an active role in its future by adopting previous comprehensive plans, but that, as change occurs, we continually revise and update.

This current comprehensive plan — the one voters will be asked to approve by written ballot at next Tuesday's town meeting — is an advisory document only.

Change can only occur if those plans are proposed and put on the warrant of subsequent town meetings.

And, before placing them on the warrant, the town will hold further public hearings. Possibly, townspeople will decide that, since conditions have changed, a proposed change is no longer feasible — just as townspeople decided that the proposal for one-way traffic (included in the 1980 plan) was not workable.

The goals and policies within the plan are based on information that was gathered over an 18-month period by all of the town's boards and committees. During spring, 1992, the comprehensive planning committee held a series of public meetings to discuss the nine goals and 70 policies that describe in more detail the issues covered by those goals.

Following those meetings, the committee incorporated our concerns and interests into discussion of the goals.

I would like to urge you all to take an active part of the future of Bar Harbor. Stop by Jesup Memorial Library, Jon Lockman's office in the town office, or the Thorndike Library at College of the Atlantic, where copies of the plan are available for the public to read.

If you don't have time to read it yourself, an informational program was recorded through Dobbs Productions. This panel discussion outlines the nine goals of the plan and discusses some of the implications.

The program is being aired October 28 through November 1 on Channel 36 at 8:30 and 9:30 p.m.

Unlike many young people throughout Maine and the nation, I have benefited from growing up in a town that has consciously tried to protect its unique character, while at the same time recognizing the need to maintain its economic viability. This is a plan for the next 10 to 15 years which will help to guide us as we continue to craft ordinances that maintain both character and economic stability. I urge you to support this plan. Your support means the town will continue to grow — to be a place where children will continue to grow up valuing the special place where they live. ■

Bar Harbor Times,

October 28, 1993

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Wetlands: an uncertain future

SCIENCE COLUMN

by Kenneth Cline

Once called "swamps" and seen only as mosquito-infested areas to be shunned, wetlands were drained, filled, and cursed by our forefathers for nearly 300 years. So successful was their campaign that more than 50 percent of our nation's wetlands were destroyed.

Over the past 20 years, there has been a growing awareness of the critical role wetlands play in the natural and human world around us. Despite this increased sensitivity, however, our society has been unable to balance the competing interests of development and the need to protect these areas.

Wetlands provide numerous benefits. Their importance as wildlife habitat is well-established and widely recognized. Birders on Mt. Desert Island are aware of their importance, as are commercial fishermen. Coastal wetlands provide nesting habitat for many species of birds; they also are the nursery and spawning grounds for more than 60 percent of the U.S. commercial fish catch.

Wetlands also provide temporary storage for floodwaters and protect downstream and inland properties from flooding. They slow the overland flow of water, thereby reducing soil erosion and sedimentation.

In addition to these functions, wetlands act as natural water filters. They cleanse surface waters and are vital to the maintenance of groundwater quantity and quality. Moreover, they provide areas for hunting, fishing, and general recreation. In light of these and other functions, it is easy to understand how the cumulative loss of wetlands can have a devastating ecological and economic impact on an area.

Although many scientists, policy-makers, and citizens are beginning to appreciate the values of intact wetlands, these areas continue to be disturbed, degraded, and destroyed at an alarming rate. Federal and state governments have created cumbersome regulatory schemes in order to curb this loss. The laws often confuse landowners, frustrate developers, and overwhelm enforcement agencies. The result has been a political quagmire with perennial efforts by industry to gut the provisions of the Clean Water Act that protect wetlands.

In an effort to balance the pressure for development and the recognized need for environmental protection, regulators in the 1980s began to draw on the new science of restoration ecology to create new wetlands. This approach, known as compensatory mitigation, was offered as a way for us to have our Walmarts and our wetlands, too.

Favored by land developers, compensatory mitigation became a cornerstone in former President Bush's much ballyhooed "no net loss" wetlands policy. President Clinton's recently announced wetlands policy seems to share Bush's optimism regarding man's ability to successfully mimic nature. Clinton has touted the creation of "mitigation banks" as a way to compensate for the loss of natural wetlands systems through the creation of artificial ones.

Given the significant societal values provided by wetlands, it is critical that created wetlands serve the same function as those wetlands they purportedly replace. Unfortunately, the technological fix has failed to materialize. After nearly a decade of effort and thousands of restoration projects, the conclusion of most scientists is that compensatory mitigation doesn't work or at least doesn't work well. There have been limited successes recreating the appearance of wetlands, but most of these new preserves simply don't measure up in terms of the functions performed by the original wetland.

A good example of the situation lies close at hand. The Maine Department of Transportation's efforts to replace clamflats destroyed in the preliminary construction of the Sears Island cargoport have been largely unsuccessful. Now, the DOT wants to fill additional acres of wetlands with the promise of creating new ones to replace them. The Environmental Protection Agency and the Army Corps of Engineers, federal agencies charged with oversight of wetlands development, have questioned whether it is even possible to replace the functional value of the forty acres of wetlands that would be lost in completing the cargoport. The DOT proposes creating replacement eelgrass beds, yet no one has ever succeeded in creating an eelgrass bed in New England.

Compensatory mitigation is a real gamble — with the odds badly stacked against the environment. Industry's track record in creating functioning wetlands is abysmal, and research biologists' success rate isn't much better. In truth, no one really knows a sure way to recreate a functioning ecosystem.

Given this uncertainty, most scientists and policy-makers agree that regulatory agencies should focus their efforts on avoiding or minimizing impacts on wetlands. If we count on creating new wetlands to remedy the destruction of existing ones, then we need to accept the reality that many of the critical values wetlands provide will be lost forever.

Ken Cline teaches environmental law and policy at College of the Atlantic and is also the chair of the Maine Chapter of the Sierra Club.

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COA holds talks with World Bank officials

Bar Harbor Times,
Nov. 11, 1993

BAR HARBOR — Six delegates from the World Bank/InterAmerican Development Bank (IDB) visited College of the Atlantic, recently, to explore possible roles for the college in international education and development projects. The visit was part of a three-day trip to Maine organized by the Maine Education Training and Export Program (METEP).

Launched earlier this year by Governor McKernan and coordinated through the Department of Economic and Community Development, the METEP program was created to respond to a strong demand in developing countries for education systems, development, and management of natural resources, telecommunications, environmental protection, and private-sector development.

METEP has been working to create active networks among the state's educational institutions and the private sector to address these international opportunities. The focus has been in five areas: industrial development and training, health care, participant training, environmental policy, and micro-enterprise development. The recent tour was hosted by the focus area of industrial development and training, which is led by Bath Iron Works.

"The education and business communities in Maine have established an important relationship through this initiative," said COA Academic Dean Richard Borden, a member of the METEP commission. "Because of METEP we are in a unique position to work on the kinds of projects the World Bank and IDB coordinate. This program is a natural extension of COA's ongoing commitment to international studies."

COA President Steven Katona was impressed by the World Bank representatives' concern for maintaining environmental quality in the countries where they work. "Collaborating with such skilled and dedicated people," said Katona, "will provide exciting opportunities for putting the college's studies of human ecology to work in the world."

Steve Kent, manager of Human Resource Business Development at Bath Iron Works, praised the organizers of the study tour. "Maine has left a very solid impression with the World Bank and IDB," he said.

Among the visitors were area specialists representing Africa, the Caribbean, and Central and South America. Their tour began with a reception with Governor McKernan at Southern Maine Technical College and included presentations at Bath Iron Works, the Small Business Development Center of Coastal Enterprises, Inc., in Wiscasset, the Penobscot School for Language Studies in Rockland, and the Maine Maritime Academy.

At College of the Atlantic, the tour's final stop, the group focused on COA's interdisciplinary approach to problem-solving and toured the college's geographical information systems and regional planning facilities. ■

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Public meeting to address environmental priorities

By Kathy Harbour
Of the NEWS Staff

ELLSWORTH — From Velpar seeping into drinking water to air pollutants blowing in from urban America, the list of environmental hazards of concern to Maine people will be the topic of discussion at four public meetings across the state this month.

The first meeting is set for 6-8 p.m. Monday, Jan. 24, at the Ellsworth City Hall.

The public meetings are part of a two-year study of environmental risks and priorities in the state, the focus of the Maine Environmental Priorities Project, a project of the Department of Environmental Protection. The project's work is under the direction of a 37-member steering committee representing business, environmental, educational and government interests. Its members were appointed by Gov. John McKernan.

Described as a new approach to policy making on environmental issues, MEPP is engaged in comparative risk analysis. With public comment a critical part of the two-year process, the steering committee will first identify the wide range of environmental problems Maine people find troubling. Those problems will then be analyzed and ranked according to their threat to public health, environmental health and the overall quality of life.

In the second year of the project, the group will select environmental priorities that are ripe for action. Such ranking of priorities, the project notes in a recent press release, is vital as "public and private resources to protect our environment are finite."

The analysis will weigh the relative risk of identified environmental threats from a scientific perspective. By using such a method, it is argued, the most important environmental problems facing the state can be identified. The list of priorities will be based on public values and scientific analysis and would serve as a guide for local and state government officials and those involved in environmental issues in the private sector.

Possible actions could include new regulations or legislation, greater emphasis on enforcement, recommendations for further research and public education.

As described in a recent issue of "Habitat: Journal of the Maine Audubon Society," the "pressure to determine which are the most pressing problems for action is mounting ... for priorities are often relative and overlaid with individual values and perspectives."

The 37-member steering committee includes representatives from diverse interests in the state, including several people from Hancock County. Local members include Jill Goldthwait, chairwoman of the Bar Harbor Town Council; Ted Koffman from College of the Atlantic, who will serve as moderator at the Ellsworth meeting; Pam Person, co-chairwoman of the Energy Policy Committee for the Coalition for Sensible Energy; and State Rep. Virginia Constantine of Bar Harbor.

Other members of the committee include representatives from the Maine Petroleum Association, the Sierra Club, Bath Iron Works, Eastern Maine Healthcare, Maine Forest Products Council, the Maine Sardine Council and several other groups.

The second public meeting will be held Jan. 26 in Caribou; the final two meetings are scheduled in Brunswick on Jan. 27 and Biddeford on Jan. 28. A teleconference will be held from 10 a.m.-noon on Saturday, Feb. 5, at several University of Maine campuses.

Those who cannot attend a public meeting are encouraged to send written comment to Maine Environmental Priorities Project, Statehouse Station 17, Augusta 04333.

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By Leila Wombacher

Human Ecology Highlights Curriculum

Leila Wombacher is an editorial assistant with GIS World, 155 E. Boardwalk, Suite 250, Fort Collins, CO 80525.

The future of GIS relies heavily on education. College of the Atlantic (COA), Bar Harbor, Maine, is doing its part to promote the technology with a degree program focusing exclusively on human ecology — the study of how humans interact with the environment. Typically enrolling about 200 students each semester, COA offers a bachelor's and master's degree in human ecology. Bar Harbor, located on Mount Desert Island, provides a natural setting for human ecology studies and GIS research. The school's GIS laboratory was founded in 1987 by Dr. John Anderson.

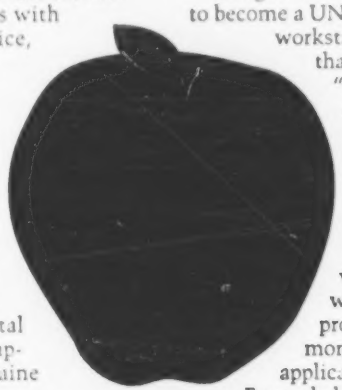
"Dr. Anderson used GIS during his doctorate dissertation mostly for ornithology studies ... and saw it could be a useful component to our curriculum here because we look at GIS as an interdisciplinary tool," explains Gordon Longsworth, director of COA's GIS laboratory.

Longsworth, who holds a bachelor's from COA and a master's in regional planning from the University of Pennsylvania, also teaches GIS and coordinates GIS projects. The school emphasizes GIS application areas such as sustainable development, community planning, human health issues and environmental concerns.

The laboratory houses a SunSPARC station from Sun Microsystems, Mountain View, Calif.; six PCs running ARC/INFO and ArcView from Environmental Systems Research Institute, Redlands, Calif; IDRISI image processing software from Clark University, Worcester, Mass.; a Trimble Navigation Ltd. Global Positioning System (GPS) base station and Trimble Basic Plus GPS software from Trimble Navigation, Sunnyvale, Calif.; a plotter from CalComp, Anaheim, Calif.; and large-format digitizing tablets from CalComp and Summagraphics, Seymour, Conn. Most of the lab's data, including dozens of layers for the Mount Desert Island region, were developed in-house. Other data sources include Acadia National Park and the Maine State Office of GIS.

The college's two GIS classes, Fundamentals of GIS and GIS: Applications Development, teach students GIS basics and how to use data once they are developed. "The two classes are a foundation to get a student's foot in the door," notes Longsworth. "Students gain practical knowledge by working on projects."

Work-study projects, summer employment, internships and senior projects apply students' GIS knowledge. The college works with the National Park Service, the Maine State Department of Environmental Protection and the Mount Desert Island League of Towns. Federal projects include work for Acadia National Park on Mount Desert Island. In addition, the lab has performed coastal and wildlife habitat mapping projects for the Maine State Department of Environmental Protection.



Scott Dickerson, a COA master's candidate, used GIS for his master's project, creating a planning method for developing ecological reserves. Dickerson identified "umbrella" species and areas, or species and areas whose protection conserves other elements of biological diversity. "If you can identify reserves so they include the full range of soil conditions present in a region, you will be preserving or conserving a broad range of habitats," he explains.

"Potential ecological reserves were delineated by integrating a set of planning strategies to select lands that contain certain attributes," says Dickerson. "GIS was the organizational tool for putting those things together."

Lab staff members work hard to bring GIS to towns and Maine organizations, including non-profit organizations such as the Maine Coast Heritage Trust. Also, the lab is developing a Maine Coast Islands GIS.

Longsworth eventually would like to see full GIS capabilities in surrounding town offices. "We have all these data here at the college," he says. "We make maps for the town offices to use in their planning process, but I'd like to see the data online in their offices — networked and open to the public."

Longsworth also would like the lab to become a UNIX operation, running workstation ARC/INFO rather than PC ARC/INFO. "We'd also like to move into scanning technologies," he adds. "Rather than using the table digitizers, we'd like to switch to scanning maps and data through an optic scanner. We want to work more with images and image processing and spend more time building GIS applications."

Expanded software and upscaled equipment are only part of what Longsworth sees for the GIS lab's future. Other planned improvements include increased faculty involvement and lab integration into the rest of the college curriculum. "For example, a course on historic geography might talk about GIS or use it," Longsworth says.

Although not all students at COA use GIS, the 10 percent or so who do find it a marketable skill after graduation. "A high percentage of students who were involved in the GIS curriculum here work and use GIS in some capacity in their professional careers," claims Longsworth. "Almost everyone who has taken it are employed and involved in GIS mapping."

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Russians coming to COA

BAR HARBOR—Nearly two dozen Russian researchers, scientists and educators will be coming to College of the Atlantic to take part in a "Risk Assessment and Environmental Management" seminar on Monday, Nov. 14. The three-day intensive event is sponsored by the U.S. Agency for International Development (US AID), the Academy for Educational Development (AED), the Maine Education and Training Export Partnership (METEP) and the college's Center for Applied Human Ecology (CAHE).

The Russians represent a diverse group of organizations including the Moscow Medical Academy, the Industrial Ecology Institute and the Russian Cities Union. Heads of laboratories, senior researchers, doctors and teachers are among the participants.

The course will provide the visitors with the groundwork for understanding the process of risk assessment, hazard identification and exposure assessment, and the use of these tools in environmental policy and regulation. Case studies and field visits will provide a context for practical application of risk assessment in environmental management.

Seven members of College of the Atlantic's faculty and staff will give presentations and lead discussions and group workshops. Academic Dean Richard Borden, a member of METEP's board of directors, will speak on the psychology of environmental decision-making; Professor J. Gray Cox will lead a workshop on "Reaching Agreements on Risk;" Professor Isabel Mancinelli will talk about growth management and regional planning; and Theodore Koffman, the college's director of government relations, will give an overview of the ECO/ECO (Economics and Ecology) Forum and the Maine Environmental Priorities Project.

Chemistry professor Donald Cass will discuss case studies of the role of chemistry in risk assessment, and Gordon Longsworth, director of the college's GIS (Geographic Information Systems) lab, will demonstrate the use of overlay technology in community decision making and planning.

The METEP course is three weeks long. College of the Atlantic is working in partnership with Robert G. Gerber, Inc., a geological engineering firm in Freeport, and Medical Care Development in Augusta to present these workshops. ■

November 10, 1994 Bar Harbor Times

Russian team to visit College of the Atlantic

BAR HARBOR — A Russian group of 25 researchers, scientists and educators will visit College of the Atlantic to take part in a seminar on risk assessment and environmental management Nov. 14-16.

The three-day course is being sponsored by the U.S. Agency for International Development, the Academy for Educational Development, the Maine Education and Training Export Partnership and the college's Center for Applied Human Ecology.

The Russian visitors will receive a groundwork for understanding the process of risk assessment, hazard identification and exposure assessment, and the use of these tools in environmental policy and regulation.

Bangor Daily News
11/10/94

Marine mammal conference set At COA

BAR HARBOR — College of the Atlantic and Allied Whale will be hosting the North Atlantic Marine Mammal Association Conference on Nov. 18-20.

The focus of this year's gathering is a discussion of photo-identification.

For 20 years this technique has been the most affordable, accessible and effective means for many researchers to study cetaceans and pinnipeds. In large part, NAMMA is made up of independent researchers and associates of small organizations rich in talent and energy, but not money, for whom data collection from opportunistic platforms is central to research goals. With the advent of new techniques which utilize advances in electronics and cellular biology, many NAMMA members feel that a comprehensive overview of the usefulness of maintaining and contributing to large photographic databases is timely.

A panel-led discussion and working groups on specific areas of interest will help promote this dialogue. Panelists will include Scott Kraus, director of the Right Whale Consortium Catalog and a researcher at the New England Aquarium in Boston; David Mattila, senior scientist at the Center for Coastal Studies in Provincetown, MA; and Judy Allen, associate director of Allied Whale and director of the North Atlantic Humpback Whale catalog. Steve Katona, president of the college and an authority on marine mammals, will moderate the panel.

Other agenda items include a business meeting for members to discuss and vote on the future direction of NAMMA and group meetings on a variety of pressing topics which tentatively include Western North Atlantic seal populations, Internet/Whalenet, whale watching guidelines/regulations, fisheries interactions, habitat studies and conservation. Tours of the COA GIS lab are also available.

The conference will be held at COA.

For more information, call Allied Whale at 288-5644.

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The Bar Harbor Times

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February 2, 1995

TRUE GRIT

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A COA STUDENT FULFILLS DREAMS

Story by Letitia Baldwin

Photos by Letitia Baldwin and Rebecca Aubrey

Standing atop Cerro de Los Animas, a mountain along the eastern seaboard of Uruguay, and gazing down at the Rio de la Plata snaking across a rolling plain dotted with cattle would have been a fanciful dream in the mind of Rebecca Aubrey five years ago.

Neither would the young woman have imagined herself plastered with leeches – like Katherine Hepburn in *The African Queen* – after slogging in hipwaders through a swampy lagoon with towering palm trees overhead.

Nor would she have envisioned trekking across the great stretches of pristine beaches in the eastern province of Rocha or sipping *hierba maté* from a *bombilla* – a contraption resembling a hookah – and chatting in Spanish with Uruguayan intellectuals in the capital of Montevideo.

Five years ago she was a high school student in Windham, CT, whose foreign travels had been confined to a weekend trip to Grand Manan Island in New Brunswick. And her guidance counselor had it in mind for her to stay put in her home state and attend a local college.

A determined young woman, Rebecca is not someone to allow her future to be

Six months previously a Uruguayan educator had come to the COA campus in pursuit of a computer-mapping system, Geographic Information Systems, in which detailed geographic information can be layered on a map at the touch of just a few keystrokes. The technology existed in his country but had not been applied to environmental research.

Eduardo Gudynas was affiliated with the Franciscan Multiuniversity of Latin America in Montevideo. He wanted to use the technology to manage wetlands in Uruguay's eastern province of Rocha, where wetlands have been drained to make room for rice paddies – threatening a major breeding area for the chaj and other native birds.

Like COA, the Multiuniversity has a strong environmental program, offering a master's degree in ecology. Mr. Gudynas also envisioned using the GIS techology to develop a conservation plan for Uruguay's coastline bordering the Atlantic. Entire illegal communities have surfaced in some remote "nationally protected" coastal areas like Cabo Polonio.

Uruguay's budding tourism industry poses another threat to these fragile coastal environments. The nation has become a popular, economical vacation

dictated by others. Perusing her elder sister's college catalogs, she came across a brochure for a small, unique Maine college whose underlying philosophy was human ecology. She had developed a special interest in environmental law and policymaking. Rebecca made up her mind to attend College of the Atlantic.

"I loved the way the atmosphere sounded: small and personal. It just struck me this was the place for me," recalls the COA junior, who from then on took charge of her own education. Unable to afford the tuition on her own, she has balanced her academic work with workstudy, waitressing and other part-time jobs around town in order to fulfill her goal.

PERUSING HER ELDER SISTER'S COLLEGE CATALOGS, SHE CAME ACROSS A BROCHURE FOR A SMALL, UNIQUE MAINE COLLEGE WHOSE UNDERLYING PHILOSOPHY WAS HUMAN ECOLOGY.

"It meant a lot to me to be able to come here," she relates. "The idea of settling for something less made me want to come even more."

After three years away from her home state, Rebecca grew bolder in her ambitions and resolved that by hook or by crook she was going to spend three months tens of thousands of miles away in the South American nation of Uruguay.

Why Uruguay?

destination.

"Uruguay is quite a poor country and the Argentinians are interested in vacationing there," says Rebecca, relating how dune buggies are eroding the sand dunes. The recreational vehicles are also wreaking havoc with wildlife habitats.

Rebecca is among several students who have worked in COA's GIS laboratory, putting the computer-mapping technology to practice here on Mount Desert Island. They have collaborated with some island towns and Acadia National Park to develop layered maps for assessing the potential impact of development on watersheds and wildlife.

Because of her work in the GIS lab, Rebecca was given the opportunity of traveling to Uruguay and setting up the computer-mapping system at the Franciscan Multiuniversity of Latin America. COA conservation biologist John Anderson would eventually join her. Never having set foot outside the United States for any real length of time, she rose to the challenge.

Drawing on her high school Spanish, she translated the commands for the GIS software. She also spent three months producing a series of base maps of Uruguay,

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Second Balcony

TRUE GRIT, continued

showing the country's major cities, rivers, mountains and other features.

Simply getting to the South American nation was no easy task. While funds from the college's U.S. Department of Education grant helped cover some of her expenses, Rebecca also had to contribute a chunk. She worked as a nanny and waitressed at the Village Green Bakery last summer in order to buy the $950 airplane ticket and afford other expenses that would arise during her three-month stay.

AS HER SENIOR PROJECT SHE HOPES TO COLLABORATE WITH JORGE DE LEON AND CREATE A CENTER FOR MONTEVIDEO'S STREET CHILDREN. GIVEN HER GREAT DETERMINATION, SHE WILL LIKELY MAKE THAT HAPPEN.

Last September she flew from New York to the Argentine capital of Buenos Aires where she transferred, flying on to Montevideo. Stepping off the plane in the Uruguyan capital was like entering another world.

"I was prepared for it to be different," recalls the COA student, who was still bowled over by the degree of poverty she [illegible] peddling chewing gum and trinkets in order to scratch out enough money for a bite to eat.

While she had some knowledge of Spanish, it took her a while to adjust to communicating almost entirely in the foreign tongue. At the Franciscan Multiuniversity, she had the challenging job of teaching the librarian, Jorge de Leon, two political science students and a geography teacher how to use the GIS system.

"It always amazed me that I couldn't speak Spanish perfectly, but somehow I could always make myself understood," she remembers. "After a while, it just sort of clicked..."

Dealing with Uruguayan men was another challenge. *"Ah! Mama! Guachita!"* and other forward greetings would follow the fair American woman with flowing brown hair as she went about her activities in Montevideo. Rebecca says she learned to ignore the comments and minutes as a form of chivalry.

Over a steaming *hierba maté* tea one recent wintry day in COA's Blair Dining Room, Rebecca recounts that one of her most memorable experiences was getting to know an 8-year-old street girl. She learned the child was on the streets peddling coloring books and other knick-knacks by 3 a.m.

"If she made a certain amount of money in a day, she would be given half. She was very proud of herself," recalls the COA student, remembering the smile that broke across the girl's face when asked if she'd like to color. "Just the smile on her face made my day."

The encounter has inspired her to return to Uruguay this coming year. As her senior project, she hopes to collaborate with Jorge de Leon and create a center for Montevideo's street children. Given her great determination, she will likely make that happen.

"I came back very energized," says Rebecca. Her green eyes are shining and there is a radiance about her. She says, "I never would have had this opportunity [illegible]

College of the Atlantic conservation biologist John Anderson, left, joined Rebecca Aubrey, right, and Multiuniversity librarian Jorge de Leon on a trip to Uruguay's eastern province of Rocha where the pristine white beaches and sur-

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UPDATE

NEWS FROM THE MAINE ENVIRONMENTAL PRIORITIES PROJECT

Fall 1994 · Vol. 1, Issue 2

Project Gains New Perspectives At Roundtables

Maine citizens provide valuable insights

Three Roundtables were held in June and July and several more discussions are being organized for the early fall. These forums serve a key function in the comparative risk process by helping ensure that the Project works with comprehensive information about the environmental concerns and perspectives of Maine people.

On June 29 in Augusta, the Project met with 14 people representing interests in outdoor recreation, tourism, camps and hunting. The small group setting and facilitation were designed to encourage discussion among participants and to address as many issues as possible in the time available. After listening to the group's concerns and probing the nature and level of those concerns, participants were given the environmental issues list developed by the Project and asked to evaluate its comprehensiveness.

The Steering Committee and Technical Working Groups will use a detailed record of the discussions to inform the comparative risk evaluation process. A sampling of the issues discussed is presented here to give interested parties a sense of how the Roundtables work.

The outdoor recreation group identified a number of concerns about access to coastal, public and private lands, and expressed a strong feeling that continued access to the land is important. The limited capacity of some areas to support tourism was discussed, as was noise pollution on lakes in southern Maine.

Visual pollution was mentioned in connection with land use and concerns about the quality of the countryside. This included concern about the placement of billboards, signage, utility lines and poles and the visual impact of clear-cuts.

The provision of safe drinking water was mentioned as a serious issue. There was concern that the Safe Drinking Water Act has had the effect of closing some seasonal wells and springs because required filtration was not cost effective. The end result, some said, is that some seasonal users have turned to less safe surface waters. Participants also were concerned about the impact on tourism of health advisories, such as the advisory on mercury in fish.

Even this small sampling of the discussion shows that participants are bringing a wide range of concerns to the Roundtable discussions. "We're hearing about issues that touch on all parts of the Project's work — concerns about quality of life, health and environmental quality," said Ted Koffman, a Steering Committee member who observed the June 29 Roundtable discussion. "The public is challenging us to see all the issues and to see all sides of the issues."

Participants in the discussion included Ed Andrews of the Maine Youth Camping Association, Jim Thompson of the Maine Publicity Bureau, Evelyn A. McAllister of the Rangeley Lakes Chamber of Commerce, Thomas C. Hildreth of Sugarloaf Hotel, Jim Gorman of the Sportsman's Alliance, John P. McCatherin of New England Telephone Co., Donna L. Moreland of the Moosehead Lake Region Chamber of Commerce, Wanda L. Plumer of the Brunswick Area Chamber of Commerce, Dianne C. Tilton of the Sunrise County Economic Council, Russell Walters of Raft Maine,

(continued on page 4)

MEPP Issues List

The following is a summary of the environmental issues that are being analyzed in Maine's comparative risk process. This list was developed through wide public input, including public meetings and a statewide telephone survey of 901 Maine residents, and was checked for completeness at recent Roundtable discussions. In addition, the Project's Steering Committee and technical working groups, representing a range of perspectives and expertise, contributed to the list.

The issues listed here are not in priority order:

■ Contamination of Land

Includes risks from both point and non-point source discharges to land. This topic includes issues such as the application of pesticides and herbicides in forest, agricultural, commercial and household settings; atmospheric deposition; chemical spills; land application of wastes; and discharges from waste facilities.

■ Contamination of Surface Water and Sediments (Fresh Water and Marine)

Includes risks from both point and non-point source discharges to fresh waters and marine waters and the accumulation of contaminants in sediment. This topic includes issues such as the impact of runoff from forest, agricultural and developed lands; atmospheric deposition; chemical spills; discharges from waste facilities; discharges from septic systems; and industrial discharges.

■ Contamination of Ground Water

Includes risks from both point and non-point source discharges to ground water. This topic includes issues such as infiltration of pesticides and herbicides; atmospheric deposition; chemical spills; malfunctioning septic systems; land application of wastes; discharges from waste facilities; and industrial discharges.

(continued on page 2)

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(continued from page 1)

■ Drinking Water at the Tap

Includes risks associated with the extraction, treatment and distribution of drinking water. This topic includes the risks associated with chlorination, fluoridation, biological contaminants, lead and other contaminants from distribution systems.

■ Outdoor Air Pollution

Includes risks posed by all contaminants (originating from both within and outside of Maine) in ambient outdoor air. This topic includes ground level ozone, sulfates/sulfites/sulfur compounds, nitrates/nitrites/nitrogen compounds, particulates, air toxics, and other volatile organic compounds attributable to both stationary and mobile sources.

■ Indoor Air Pollution

Includes risks posed by the presence of airborne contaminants in residences, work places and public buildings. The topic includes risks such as radon, environmental tobacco smoke, lead contaminated dust, particulates including asbestos, other toxins including products of combustion from space heating and off-gassing from building materials and home furnishings.

■ Exposure to Toxins in the Work Place

Includes risks posed by the use of chemicals in the work place. The topic includes exposure to hazardous materials used in the manufacturing and service industries, agriculture, food processing, transportation, energy production, and waste treatment.

■ Degradation of Forest Resources

Includes risks posed by the degradation or unsustainable use of Maine's forest resources. This topic includes the effects of pollution, effects of management practices, and the effects of forest conversion.

■ Degradation of Marine Fisheries Resources

Includes risks posed by the degradation or unsustainable use of Maine's marine fisheries resources. This topic includes the effects of pollution such as toxins, effects of actions such as harbor dredging, effects of management practices, the impacts of waterfront conversion, and the loss of working waterfronts.

■ Degradation of Agricultural and Other Economic Land Resources

Includes risks posed by the degradation or unsustainable use of Maine's agricultural and other land resources. This topic includes the effects of pollution, agricultural practices, loss of agricultural land to development or forests, sand and gravel depletion, and mining.

■ Alteration and Destruction of Terrestrial Ecosystems

Includes risks posed by physical and chemical changes to Maine's terrestrial ecosystems. This topic includes risks as-

Project Will Look At Management Strategies In Next Phase

The comparative risk approach to environmental concerns is similar to how a software engineer goes about creating a new computer program. First, it's important to understand—in detail—the problems that must be solved for the computer user. After that, a coherent package is put together.

Maine's comparative risk analysis is well into part one of that kind of effort—understanding problems and concerns in detail. But, the Project does not end with part one. In the middle of next year, the Project will move from its focus on identifying and analyzing risks to phase two—managing risks. This phase will involve examining possible solutions or strategies for managing the risks identified in phase one.

"We've found at our first public meetings and recently at the Roundtables that people are eager to talk about management strategies. That opportunity is on the horizon and we'll be looking for their continued input," said Sherry Huber, a member of the Steering Committee.

The management strategy phase will begin after the Steering Committee has ranked Maine's environmental risks based on scientific information from the technical working groups and the knowledge of public values and concerns developed through public involvement activities.

The Steering Committee's evaluation of management strategies will take into account what was learned about risks and public values in phase one. They also will look at new factors, such as the costs, feasibility, legal framework and public acceptability of different options for addressing the known risks. For example, loss of jobs could be considered as a cost connected with a specific management strategy.

The Steering Committee will recommend changes in environmental policy after examining current management strategies through this thorough framework.

The Progress of Maine's

MARCH 1993
After 18 months planning by the state Department of Environmental Protection and the ECO/ECO policy forum at College of the Atlantic, the federal Environmental Protection Agency awards a grant for a comparative risk analysis in Maine.

MAY 1993
Gov. John R. McKernan appoints Maine Environmental Priorities Project Steering Committee to direct the comparative risk analysis.

JULY 1993
Steering Committee orientation meeting at College of the Atlantic.

DECEMBER 1993 TO FEBRUARY 1994
Project engages the public in identifying key environmental issues through a series of public meetings, focus groups and a public opinion survey.

MARCH 1994
Human Health, Ecological, and Quality of Life working groups organize and prepare for study of issues.

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MAINE ENVIRONMENTAL PRIORITIES PROJECT
STEERING COMMITTEE AND STAFF

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Director, State Planning Office

Patricia Aho
Executive Director, Maine Petroleum Association

John Banks
Director, Department of Natural Resources Penobscot Nation

Richard Bennett
State Representative, Norway

David Boulter
Director, Land Use Regulation Commission

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Sierra Club (Maine Group)

James Reed Coles
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Kevin Gildart
Assistant to the President, Bath Iron Works

Jill Murdoch Goldthwait
Chair, Bar Harbor Town Council

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Assistant Professor Lewiston-Auburn College, USM

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Attorney, Pine Tree Legal Assistance

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Fred Hurley
Director, Bureau of Resource Management Dept. of Inland Fisheries and Wildlife

Jeffrey Kaelin
Executive Director, Maine Sardine Council

Theodore Koffman
ECO/ECO Coordinator College of the Atlantic

Ronald Kreisman
General Counsel Natural Resources Council of Maine

Paul Merrill
President, Merrill Industries, Inc.

Mason Morfit
Vice President The Nature Conservancy/Maine Chapter

Pamela Person
Coalition for Sensible Energy

Floyd Rutherford
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President, Tewhey Associates

Karin Tilberg
Attorney, Hallowell, Maine

Meredith Tipton
Director, Public Health Division City of Portland

Thomas Urquhart
Executive Director Maine Audubon Society

Staff

Cynthia Bertocci
Project Administrator Department of Environmental Protection

Karl Wilkins
Department of Environmental Protection

Facilitators

Ann Gosline
Attorney, Litchfield

Jonathan Reitman
Attorney, Brunswick

U.S. EPA Contact

Debra Gutenson
Regional and State Planning Branch U.S. Environmental Protection Agency, Washington, D.C.

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TECHNICAL WORKING GROUPS

(Editor's note: The names and affiliations of participants in the ecological, human health and quality of life technical working groups are reported in this edition of Update to give you a sense of the range of experience the Project has called on. Please note that the listing of an affiliated organization is not intended to indicate that organization's endorsement of the Project.)

Ecologicial Technical Working Group

John Albright
Private Consultant, Wildlife Management

Michael Cline
Maine Audubon Society

Robert Cope
Champion International

David Courtemanch
Department of Environmental Protection

Gary Donovan
Department of Inland Fisheries and Wildlife

Franklin Eggert
University of Maine/Horticulture–retired

Ivan Fernandez
University of Maine/Forest Resources

Anne Hayden
Brunswick, Maine

Jeffrey Kahl
University of Maine/Watershed Geochemistry

Joseph Kelley
Maine Geological Survey

Richard Langton
Maine Department of Marine Resources

Paul Leeper
Eco-Analysts, Inc.

Carolyn Lepage
Robert G. Gerber, Inc.

John Lortie
Woodlot Alternatives, Inc.

Donald Mairs
Maine Department of Agriculture

Janet S. McMahon
The Nature Conservancy, Maine Chapter

Thomas Saviello
International Paper

John Sowles
Maine Department of Environmental Protection

Edward Spear
Great Northern Paper, Inc.

Barbara St. John Vickery
The Nature Conservancy, Maine Chapter

Robert Steneck
University of Maine Darling Marine Center

Ken Warner
Department of Inland Fisheries and Wildlife

Human Health Technical Working Group

Gregory Bogdan
Department of Human Services

Rodney Bushway
University of Maine/Biochemistry

Ronald Deprez
Public Health Research Institute

Richard Doherty, M.D.
Foundation for Blood Reseach

Philip Haines
DHS, Health and Environmental Testing Laboratory

Edward Hayes, M.D.
Department of Human Services

Bruce Hunter
Department of Environmental Protection

Donald Magioncalda, M.D.
Kennebec Valley Medical Center

Lisa Miller
Private Consultant, Health Behavior/ Health Education

Beverly Paigen
The Jackson Laboratory

Gary Patzlaff
Bath Iron Works

Ellen Parr-Doering
Department of Environmental Protection

James Smith
ChemRisk

Brian Stetson
Great Northern Paper

Douglas Thompson
University of Southern Maine/Epidemiology

Marvin Schneiderman
National Reseach Council, Board on Environmental Studies and Toxicology

Peter Washburn
Natural Resources Council of Maine

Quality of Life Technical Working Group

Brian Beal
University of Maine–Machias/Marine Sciences

Ron Beard
University of Maine/Extension Educator

Fred Beck
F.M. Beck, Inc./Geologist

Earle Bessey
E.D. Bessey & Son/Timber Products

Thomas Cieslinski
Bureau of Parks and Recreation

Ben Emory
Land Conservation Consultant

Steve Evans
Maine Yankee/Environmental Engineering

David Field
University of Maine/Forest Economics & Operations Analysis

Marion Harris
Pine Tree Legal Assistance, Inc./Case Worker

Mary Ann Hayes
Maine Association of Planners, Dairy Farmer

Dick Hill
University of Maine/Energy Specialist

Tom Howard
Georgia-Pacific Corp.

Jolan Ippolito
Sunday River Ski Resort

Michael Kelly
Advanced Management Catalyst, Inc.

Denise Lord
Maine Waste Management Agency

Fran Rudolf
Maine Department of Economic & Community Development

Mary Smith
Central Maine Power

Stewart Smith
University of Maine/Economics

William Stone
University of Maine/Psychology

David Vail
Bowdoin College/Economics

James Vitelli
Retired Professor of English and American Civilization

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sociated with loss of biodiversity, ecosystem fragmentation, community change including loss of native plants and increase in exotics, toxic contamination of wildlife, habitat destruction including effects of clear cutting, loss of game and non-game species, and wetlands loss.

■ Alteration and Destruction of Freshwater and Marine Ecosystems

Includes risks posed by physical and chemical changes to Maine's freshwater and marine ecosystems. This topic includes risks associated with loss of biodiversity, ecosystem fragmentation, hydrologic manipulation, community change including loss of native species and increase in exotics, toxic contamination of fish and shellfish, habitat destruction, fisheries losses, and coastal wetlands loss.

■ Degradation of Maine's Built and Natural Landscape

This topic examines issues such as loss of wildness; loss of Maine's rural character; townscape degradation; problems associated with urban growth; and the loss of access to shoreline, beaches, public lands, etc...

■ Stratospheric Ozone Depletion

Includes risks posed by the effects of increased ultraviolet radiation because of damage to the earth's protective ozone layer.

■ Global Climate Change

Includes risks posed by climate changes caused by the build-up of carbon dioxide and other "greenhouse gasses" in the atmosphere. This topic also includes a discussion of the potential impacts of sea level rise.

■ Generation and Disposal of Solid Waste

Includes risks posed by the generation and disposal of solid and special waste. This topic includes issues such as waste generation and management costs, unsustainable levels of consumption, excessive packaging, recycling and litter. (The impacts associated with the release of contaminants from solid waste facilities are discussed under "Contamination of Land," "Contamination of Surface Water and Sediments," "Contamination of Ground Water.")

■ Generation and Disposal of Hazardous Waste

Includes risks associated with the generation and disposal of hazardous wastes. The topic includes issues such as waste generation and management costs, impacts of uncontrolled hazardous substance sites, and household hazardous waste generation. (The impacts associated with the release of contaminants from hazardous waste facilities and uncontrolled hazardous substance sites or during transportation are discussed under "Contamination of Land," "Contamination of Surface Water and Sediments," "Contamination of Ground Water.")

■ Radiation

Includes risks posed by the generation, transportation and storage of high level and low level radioactive wastes. This topic also includes risks posed by exposure to electromagnetic fields.

■ Food Safety

Includes risks to food quality and safety due to contamination prior to processing. This topic includes risks associated with pesticide residues; use of hormones, drugs, growth accelerators; contamination of fish and shellfish by heavy metals and other chemical contaminants; red tide and paralytic shellfish poisoning; and contamination of game species.

Financial And Volunteer Support

The Project received financial contributions from Georgia-Pacific and Maine Yankee this summer. The full list of contributors to date includes the following organizations, foundations, businesses and government agencies:

Georgia-Pacific: $2,000

Maine Yankee: $2,000

The Jessie B. Cox Charitable Trust: $50,000

The Betterment Fund: $30,000

The Davis Conservation Foundation: $20,000

The Nature Conservancy/ Maine Chapter: $5,000

The Environmental Protection Agency: $100,000

The Steering Committee appreciates this important financial support. In addition, technical assistance and support from the Department of Environmental Protection and other state agencies is a critical contributor to the success of the Project. We also recognize that this kind of work would not be possible without extensive volunteer support. Our technical working groups members have given their expertise and 100s of hours to the Project. Their efforts and expertise are greatly appreciated.

Comparative Risk Analysis

94 1995 ▶

SPRING/SUMMER 1994
Steering Committee invites groups with an interest in the Project's work to take part in ongoing roundtable discussions about the issues.

WINTER 1995
The three technical working groups make their initial reports to the Steering Committee and the public.

SPRING 1995
Public and peer review of the technical working group reports. Steering Committee ranks issues according to relative risk based on final information from the technical working groups.

SUMMER/FALL 1995
Project examines current and potential management strategies. This examination considers what was learned about risks and public values in the first phase of the Project, additional public input, and the costs of various options for addressing the problems.

JANUARY 1996
Steering Committee recommends priorities for changes in environmental policy.

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(continued from page 1)

Don Sproul of the Maine Campground Owners Association and Tim Ellis of Trellis. Dale Wheaton of the Maine Sporting Camp Association commented by mail.

On July 20 in Portland and July 21 in Bangor, the Project listened to the concerns of environmental groups. Among some of the concerns expressed in the Portland group were threats from dioxin, radiation and toxins in the environment; the need for land conservation; and conservation of biodiversity.

Water quality, and in particular the need to improve local wastewater systems, was seen as important. Air quality also was seen as an important and especially challenging issue to manage because of its scope and lack of definition. The group identified the spending of Maine's environmental capital and resources for short-term gain as a fundamental issue. There was a strong feeling that the lack of any system to fully account for all impacts on environmental quality is central to many environmental problems.

Participants in the discussion included John der Kinderen of the Land Stewards Trust, Bill Linnell of the Committee for a Safe Energy Future, Rudy Engholm of the Environmental Air Force, Don Hudson of the Chewonki Foundation and the National Audubon Society, Dusti Faucher of Friends of Presumpscot/Presumpscot River Alliance and Mike Hill of the Atlantic Salmon Federation.

At the Bangor Roundtable concerns were brought up about the status and quality of freshwater fisheries; toxins in land, air and water; the quality of waterways and groundwater; global warming; and the alteration and destruction of freshwater and marine ecosystems. Lack of planning in all areas of environmental management also was an important theme in the Bangor discussion.

Participants in the discussion included Phil Marletti of Citizens Against Nuclear Dumps, Ron Huber of the Coastal Waters Project, Brenda Smith of Friends of the Environment, Robert Phipps of the Coalition for Sensible Energy, Richard Komp of the Maine Solar Energy Association, Jim Freeman of the Mt. Blue Coalition, Don Shields of the Penobscot River Coalition and Joseph Spaulding of the National Audubon Society.

Roundtables to be held this fall will include representatives of health professions, small businesses, agriculture and fisheries. These discussions are providing a rich information resource for the Project, including recommendations on information resources to be considered in the comparative risk analysis.

The Steering Committee appreciates the efforts of those who have participated in Roundtables to date and those who we will be hearing from soon.

Staying In Touch

MEPP staff and Steering Committee members have made presentations to several groups in recent months about the Project's work and the comparative risk process in general.

Among just some of these sessions: Steering Committee members and Project staff have attended meetings of the Agricultural Council of Maine and visited the Lakeville Camp Owners Association in Lakeville. A Project staff person also met with the Georges River Tidewater Association in Thomaston.

These meetings are a vital way for the Project to stay in touch with interested parties as the process moves forward. Please call Cynthia Bertocci or Karl Wilkins at 287-6843 or write the MEPP at State House Station #17, Augusta, ME, 04333 if your organization is interested in hearing from a MEPP speaker.

Maine Environmental Priorities Project

State House Station #17, Augusta, Maine 04333

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